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Localization of Foreign Bodies*

JAMES F. BRAILSFORD, Ph.D., M.D., F.R.C.P. (Lond.), F.I.C.S.
BIRMINGHAM, ENGLAND

RADIOGRAPHY will indicate the presence of any foreign body which is lighter or denser than the tissues in which it is embedded, but it will not show material of the same relative density. Interpreted generally, this means that metallic and some glass fragments, as well as collections of air which have been forced into the tissues or gas which has been generated within by anaerobic organisms, cast a shadow. Pieces of clothing (Fig. 1), leather, fragments of wood and material of like density cannot be demonstrated by means of x-rays. Radiographs of wounded patients must be interpreted in this light.

Localization of a foreign body is necessary: (a) to determine its relation to the viscera, etc.; (b) for the purposes of aiding surgical removal. Especially in the former case, fluoroscopic screening of the patient will be necessary.

FLUOROSCOPIC SCREENING

Fluoroscopic screening will enable the radiologist to see whether a foreign body alters its position relative to other structures on movement of the patient, and to determine whether or not it is within or without a visceral cavity. This is most necessary in the case of penetrating wounds of the chest; for instance, movement of metal fragments in the current of blood within the heart is sometimes the cause of failure of visualization on a radiograph. If all radiographs were taken at exposure of less than one-twentieth of a second, probably even under these conditions foreign bodies would be revealed. Fluoroscopy is especially valuable in locating foreign bodies

Fig. 1. Radiograph showing casing of bullet in upper arm with insert photograph of extracted casing containing portion of dirty khaki tunic—case of delayed tetanus.

which have penetrated so far from the entrance wound that radiography of the immediate neighborhood of the wound would fail to detect them; it is not exceptional to find that a bullet has traversed almost the whole length or breadth of the body before coming to rest.

*Presented at the Fourth International Assembly of the International College of Surgeons, New York, June, 1943.

Fluoroscopy can also be used to obtain a good general idea of the location of the foreign body by means of such units as the localizing profundoscope, but this should be regarded as an investigation preliminary to accurate radiographic localization. It will be realized that fluoroscopy has definite limitations; it is subsidiary to radiographic localization. Unbridled fluoroscopy has been responsible for unnecessarily increasing the time expended in searching for foreign bodies, for unnecessarily extending the incision and traumatizing tissues which, had the foreign body been localized accurately, would never have been touched. Lastly, if fluoroscopy is employed on a large scale in a busy hospital, it becomes definitely dangerous to the staff of the department.

ACCURATE RADIOGRAPHIC LOCALIZATION

The best interests of the patient and surgeon are met, and the latter's time for removal of the foreign body reduced to a minimum, if a careful localization is carried out.

Due thought must be given to the relation of the foreign body to overlying and neighboring structures and to the position which should be adopted by the patient when the time comes for operative intervention. Speed in localization should be reckoned by the time taken for surgical removal rather than that occupied by the radiography; unsuccessful attempts at removal, which are often lengthy procedures, are really the responsibility of the radiologist. In the casualty clearing stations, wounded patients require prompt surgical treatment, radiography for the localization of foreign bodies under these circumstances is usually impracticable, but fluoroscopic screening may be possible. Many foreign bodies will be found and removed by the surgeon when excising the wound. The track of those foreign bodies which have penetrated to a great depth may be situated in or near important structures and, in exceptional circumstances, after excising the wound as far as is practicable, more elaborate localization must be postponed until the patient is evacuated to the base.

In this connection it should be emphasized that the mere detection of a foreign body does not necessarily warrant an extensive surgical exploration for its removal. The size of the foreign body is not the determining factor, a large one may be situated in a relatively harmless site where it may never cause trouble, or where surgical removal would entail a greater risk than leaving it alone. On the other hand a small fragment may be close to some important structure which it will ultimately damage. In one case seen by the author a small metal fragment less than ¼ in. in size had lodged at the bifurcation of the common carotid artery, causing localized erosion of its wall and the production of an aneurysm. Accurate localization gave the surgeon considerable help in the successful treatment of the lesion.

A SIMPLE METHOD OF ACCURATE LOCALIZATION

It is a wise procedure to mark with a metal pointer the site of the entrance wound on the antero-posterior and lateral radiographs taken at the preliminary investigation, for these will give a good indication of the relative positions of the entrance wound and the foreign body—the major portion of the latter being in the neighborhood of the former. The point of a straightened-out safety pin laid on the film is excellent for the purpose. If the surgeon indicates that he wishes to remove the foreign body, these preliminary radiographs, or in those cases in which the foreign body

has been discovered at a more distant site by fluoroscopy, the skin markings made at that examination can be used to decide the position in which the patient should be placed during surgical removal of the foreign body. The patient is put into that position and fixed, and to prevent any movement during the whole of the subsequent localization the affected part should be on a thin support under which one can slide the films before and after exposure. A metal marker is then affixed to the skin immediately over the point beneath which the foreign body is considered to be lying. The simplest and best form of metal marker used by the author is made from a piece of iron wire, such as is used by florists. It can be bent readily into the shape shown in Fig. 4 and to any desired size; ½ to ¾ in. is the most convenient size. These markers do not obscure the foreign body and, as each of the corners is distinctive, the relative position of the nearest corner to the foreign body can readily be recognized. Similar markers are then placed on either side of the area to be radiographed, in the position which the preliminary radiographs or marks indicate as the plane of the foreign body. The x-ray tube is then centered over the marker on the superior surface and a radiograph is taken, the film used being no greater in size than that necessary to show the relation of the metal markers, foreign body and adjacent distinctive skeletal features. A lateral radiograph is taken, either by movement of the tube into the desired position or by the additional portable unit which is often available for the purpose, the central ray of the tube being directed along the course of the markers placed on the skin. From these two radiographs it will usually be possible to put a permanent mark on the skin for the surgeon's direction. If, however, the original position of the metal markers indicates a serious error in judgment of the position, they should be reapplied in the better position now indicated and further similar radiographs taken. Being satisfied with the position of the foreign body relative to the markers, the point of the marker overlying the foreign body should now be marked on the skin by a small cross made with a sharp scalpel. This will not be removed in the subsequent skin preparation. If the radiologist is not able to be present at the operation to fix the patient in the position used for the localization, his report should be so worded that the position on the x-ray couch can be accurately reproduced on the operating table. The radiographs must accompany the patient for reference. Attendance by the radiologist will ensure that coöperation which is most desirable for rapid extractions. Such anteroposterior and lateral radiography will ensure successful extraction in the minimum time from most sites in the body. It will be apparent from examination of Fig. 2 that the ordinary anteroposterior and lateral radiographs may be very misleading as to the depth of the foreign body in a part with a spherical surface. If the outline of the spherical body represented in Fig. 2 as lying on an x-ray film HI be the part containing the foreign body X, it will be seen that when the tube I is centered over the mid-plane of the body the shadow X will fall on HI at B, and the outline of the periphery of the part will fall on C, suggesting that BC is but a slight exaggeration of the depth of the foreign body from the skin. Similarly, in the lateral radiograph MN, with the tube at II, DE suggests the depth of the foreign body from the skin. With the aid of the attached metal markers it will be readily apparent from the approximation of their shadow that the actual depth from the skin in both directions is much less. When a relatively accurate

skin localization has been obtained with the aid of a marker, a further radiograph, with the central ray III G forming a tangent to the skin surface at the

Fig. 2. Anteroposterior and lateral radiographs of a bullet in the spinal canal at the level of the 7th cervical and 1st dorsal bodies.

site of the marker Y, will project the shadows of the marker and foreign body in their true relationship. Thus in Fig. 3, rays from the tube at III project the shadow of the marker Y and the foreign body X, on to the film at BO at G and F, GF being a practical estimate of the depth of the foreign body from the skin.

When the foreign body is so situated that its relation to certain elements of the skeleton or other important structures can be readily appreciated from the radiographs, reference to a cross-section atlas of the body may give additional useful evidence. The actual depth of the foreign body and certain distinctive skeletal features can be obtained by using a modification of the method devised by Mackenzie Davidson. In this, two exposures are made on one film; the

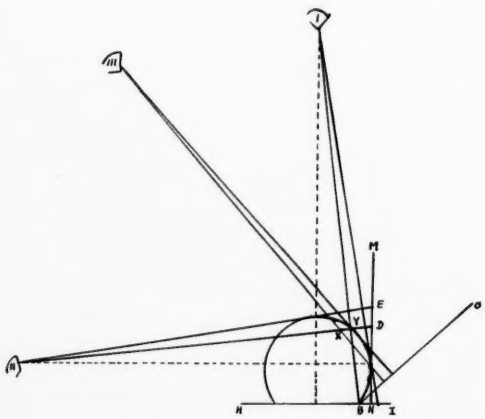

Fig. 3. Projection of surface of part and foreign body with three different positions of the x-ray tube and film.

tube, at a known distance from the film, is shifted a known distance between each exposure. When such a film is developed it will show a double image, not only of the foreign body and metal markers which may have been attached to the skin, but also of the outlines of the bones (See Fig. 4). The distance between any two shadows of the same point in an object can be measured on the film by compasses, and from this the accurate depth from the surface can be readily determined as follows: In a convenient

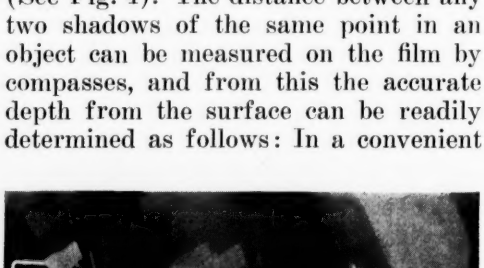

Fig. 4. Three radiographs showing a metal fragment on a plane with the lesser trochanter. The plane of the foreign body and the bony outlines can be determined from the double image radiograph, but the lateral indicates more clearly its relation to the bone. The lateral radiograph shows more clearly the relations of the bone, the probe in the sinus and the foreign body. Note shape of metal marker advised.

place in the x-ray department, a scale similar to that shown in Fig. 5 is kept. On the line AB the distance of the focal spot of the x-ray tube from the film is measured. The line is marked in inches and fractions of an inch. Generally speaking, it is best to adopt a standard

Fig. 5. Measure chart for x-ray department.

tube—film distance somewhere between 15 and 20 in. The vertical line AC represents the distance the tube is moved during the two exposures—this also should be standard, say 6 cm. (most tube-stands have arrangements for this shift). To reduce distortion to the minimum the tube should be centered over the skin marker overlying the foreign body and then moved one half of the distance it is intended to move the tube between the exposures, say 3 cm. After the first exposure the tube is then moved over the mid-point to a similar distance on the opposite side of the marker, making a total shift of 6 cm. before the second exposure is made. On the vertical line drawn at D the distance between the two identical points of the images of the foreign body is measured by compasses, say DF. If a thread now be drawn taut between C and F it will cross AB, and the point at which it crosses, say X, gives the distance DX, which is the depth of that part of the foreign body from the film surface. If the measurement between the shadows of a point on the metal marker affixed to the upper surface of the skin overlying the foreign body is now made, its depth from the film surface can readily be determined (see Fig. 6), and from these the measurement of the distance of the foreign body from the metal marker is obtained by subtraction. In a like manner the respective depths of various bony outlines can be similarly obtained, but when it is desirable to compare these with the measurements of the foreign body the tube shift should be along a line at right angles to the bony outline. The radiologist should include the details of the relative positions in his report. If the foreign body is embedded in bone the position for trephining can be accurately given by a

Fig. 6. Radiograph of a bullet in the bladder. The site was determined by depth estimation with the patient erect, then prone and then supine.

needle which is pushed into the bone in the direction of the central ray. (See Fig. 7.) The accuracy can be checked by further radiographs with the needle in position.

Accurate localization before operation ensures a rapidity of extraction which cannot be approached by the more empirical use of electro-magnetic probes.

If for any reason the surgeon fails to locate the foreign body at the site indicated, a needle can be fixed at the suspected exposed site and further radiographs taken as rapidly as possible. This is much more successful than screening.

LOCALIZATION OF GAS

Radiography affords the earliest method of detecting infection by gas

gangrene organisms. Even small bubbles of gas can be detected (Fig. 8) If there is any doubt as to whether these

Fig. 7. Radiograph of the head of a patient who had a penetrating wound in the region of the nasion. Minute metal fragments are shown near the entrance wound and along the track of the largest fragment which is lying against the occiput. The point at which the skull needs to be trephined for the recovery of this larger fragment was determined by a radiograph with a metal marker immediately over the foreign body and a radiograph with the central ray at a tangent to the skull at that point.

are due to air which has been introduced at the time of wounding, further radiographs should be taken after two, eight and sixteen hours. These will indicate in the case of anaerobic infection an increase in the gas. It may take the form of a gas abscess or the fulminating type of interstitial and muscle infiltration. This can be recognized even through plaster if the radiographs are satisfactory. The gas abscess may be obviously surrounding a metallic foreign body, but in other cases the foreign material is invisible. Localization of the gas bubble by the method previously described will permit ready exploration of the site and extraction of foreign material, if present.

Further details on localization are given in the articles cited.[1,2,3]

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Fig. 8. Radiograph showing a comminuted fracture of the upper third of the ulna and multiple metal fragments as well as early signs of gas gangrene. Two small gas bubbles are shown—one anterior to the humeral condyles and one anterior to the neck of the radius. The early signs were ignored and within twenty-four hours the gas gangrene had involved the arm.

RÉSUMÉ

La radiographie permet de visualiser les fragments vitreux ainsi que les fragments de métaux. Les collections de gaz ou d'air peuvent aussi être visualisées par la radiographie. Tout corps étranger doit être localisé afin d'aider à son ablation opératoire.

L'auteur nous présente une méthode de localisation roentgénographique précise.

L'examen fluoroscopique est préconisé, surtout pour les plaies pénétrantes de la poitrine. Il peut être pratiqué dans les installations médicales du front où la radiographie n'est pas possible. A l'aide des rayons-x il est possible de faire un diagnostic précoce de la gangrène gazeuse.

SUMARIO

Fragmentos metálicos o de vidrio y colecciones de aire o gas pueden ser visualizados por la radiografía. Estos cuerpos estraños deben ser localizados: (a) para determinar la relación y proximidad a la viscera; (b) para facilitar la extracción quirúrgica.

El método de la roentgenografía de localización exacta es presentado.

La fluoroscopía se recomienda, especialmente en casos de heridas penetrantes del pecho. Es practicable en estaciones de primer auxilios, donde la radiografía no es posible.

Por medio de los rayos-x, sin embargo, la infección de gas gangrena puede ser reconocida temprano.

Выводы

Осколки металла и стекла, скопления воздуха и газа могут быть отчетливо прединородние вещества должны быть локаставлены радиографически. Подобные лизованы для: а) определения их глубины и положения, б) хирургического ид удаления.

Описывается метод точной рентгенографической локализации.

Рекомендуется рентгеноскопия, особенно в случае проникновения таких веществ в рану грудной клетки. Рентгеноскопия возможна на сортировочных пунктах, но исключается радиография. Путем применения рентгена газовая инфекция распознается раньше.

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For information about membership in the International College of Surgeons, address Mr. Ralph E. Osborne, Business Secretary, The Drake, 1512 Spruce Street, Philadelphia, Pennsylvania.

Observations on Field Surgery

VLADIMIR V. LEBEDENKO, M.D., F.I.C.S. (HON.)*
MOSCOW, U.S.S.R.

FIELD surgery is inextricably bound up with the nature and tactics of military operations. Hence it follows that plans of organization and the volume of surgical work applied successfully in one war can hardly be entirely transferred to subsequent wars. The doctrine of field surgery cannot remain dogmatic in its strategic development because both the weapons and methods of warfare change with the years.

However, there are two conditions absolutely necessary for carrying out the basic aim of sanitary service in prompt restitution of wounded soldiers into the active armies and in surgical aid.

1. Uniform conception of the principles of surgery in the field.

2. Preliminary treatment of wounded at stages of evacuation (Burdenko, Smirnov).

The fulfilment of these conditions is inseparably bound up with the adaptation of the units already available. This problem is well understood; it occupies one of the foremost places among other very serious and important problems. Not a single country, not a single army can be satisfied with the present number of surgeons. Obviously it is necessary to mobilize physicians of other specialties, to prepare them during the war, to drill them "on the march," to instil into them the necessary routines and a taste for surgery. This problem, I repeat, is of enormous significance, and upon its solution depends the quality of the work in surgical aid to the wounded at the front and rear lines.

It must be said that this problem, which arose and was recognized at the very beginning of the war, was solved by the organization of proper distribution of the force of specialist surgeons who were leaders and consultants "not by word but by deed," as teachers to systematically prepare physicians of other specialties, and, especially, young physicians. It is obvious that under a single system of preparation the methods of procedure may and must vary; they must arise from the material environment of the given medical institution, and not only from this, but even from the region, its location at the front or rear lines, during maneuvers or on a stabilized front. It will not be erroneous if I state that in the U.S.S.R. this problem has been basically overcome and is being successfully dealt with daily.

Working on battle-fields, the army physician knows that the mortality among the wounded, in the majority of cases, is not due to grave, mortal wounds, but to lack of adequate first aid at the proper time, such as checking of hemorrhage, etc. The result of the treatment, the restitution of the soldier to the front, depends largely upon a proper and timely primary dressing.

*Representative of the Red Cross of the U.S.S.R. and Red Crescent at Washington, D.C.

There exist three stages in the administration of the service of field surgery: treatment on the spot, evacuation and distribution. Which of these stages is the most important? Each war brings in major and minor corrections in answer to this question and, after each war, the existing system of organization of medical aid undergoes changes (Burdenko).

Field surgery cannot submit to a scheme prepared in advance with stabilized rules; not a single theoretically prepared system of surgical field aid can be carried out under actual battle conditions in the way it was conceived during peacetime. However, the military-sanitary service, improving continually, has its basic skeleton and a constant pattern; at the present time this skeleton is represented in the following form.

At the battle front first aid is generally administered by the wounded in person, by his comrade, or by the sanitary instructor or company aid man.

After that follow the dressing stations, where the severity of the wound is determined and the primary first aid is corrected. Evacuation is assured to the next unit: the main dressing station, medical-sanitary battalion. From there the wounded are distributed to field and evacuation hospitals.

Two principles are united under this front line scheme: (1) Medical aid is brought nearer to the soldier; the wounded are treated at the front. (2) Normal evacuation of the wounded to the following stages is assured.

The fundamental principle of sanitary service of the Red Army is the approach of qualified surgical aid as close as possible to the wounded, and the entire system of organized sanitary service submits to this principle. Eloquent evidence of the fulfilment of the principle of medical aid to the wounded soldier is revealed by the figures on the administration of first aid in the front lines: more than 90 per cent of the wounded receive medical aid there; 5-10 per cent receive it behind the regimental or divisional echelon.

The time elapsed naturally varies in accordance with the actual sanitary conditions, but in the great majority it is such that the administration of medical aid takes place within the first few hours following injury. Nothing else could explain the percentage of soldiers rapidly restored to the ranks.

The Chief of the Medical Department, Dr. Smirnov, writes in one of his works: "Since maxillofacial surgery, neurosurgery, treatment of injuries of the bones of the extremities and thoracic cavity have evolved into independent disciplines, the condition has ceased to exist in which the surgeon was a physician for all the wounded, and any wounded was a patient of any surgeon. Hence, evacuation, in contrast to the former distribution of the wounded and sick, could no longer take place without diagnostic and transport classification and without specialized hospitals, and this brought about the necessity of supplying the front lines with a sufficient number of specialists in the above-mentioned branches of surgery. It also involved the organization of special hospitals both in front and rear lines. With a satisfactory solution of this problem there arose another, not less important, the problem of administering the maximum of requisite aid to the so-called slightly wounded. According to Oppel, the above term is mostly a sorting classification. Such wounded require complete surgical aid at the front lines, and do not require evacuation into the far rear. Treatment is to be accomplished in the front zone.

I am not going into the details of the organization of the sanitary service of

the Red Army, nor into the details which bear upon the various links in the chain of activity of medical institutions. From my point of view, the principles of this service are most important, being, in the final result, to get qualified medical aid closer to the wounded soldier.

What innovations have there been in the administration of medical aid to the wounded of the Red Army, what installations have been established, what methods in the treatment of the wounded have been put into practice?

It must be borne in mind that very often the new is found in the old, as the old in the new; at times, a slight modification in the method of application of some measures suffices to transform them into something young and seemingly perfect.

The first basic problem in field surgery is front zone treatment of the wound. One of the greatest achievements in surgery since the World War, the careful, total excision of the wound, has still retained its significance and is observed in the Red Army without any exception. Primary suture has been prohibited since the first days of the war, and this decision has not been regretted.

The wide application of sulfa preparations is also undoubtedly a great achievement in surgery, and experiences during the war have proved its positive value, although even this remedy has its negative side. I am not speaking of the generally known reactions in the hematopoietic organs, inhibitory action on the regenerative properties of the tissues, etc.—we have to be reconciled to these—, but we must, nevertheless, bear in mind that the application of a sulfa preparation without adequate surgical measures may lead not only to the discredit of its value, but to a negative and, to our regret, generally belatedly recognized result. In application of sulfa preparations it is not sufficient to have under control the saturation of the organism, state of blood, temperature, pulse; one must avoid the enthusiastic idea that sulfa preparations put an end to infection in the wound and relieve the surgeon of the necessity for vigilance. The state of the wound must remain the unalterable criterion for the attitude of the surgeon.

The above applies also to the closed plaster cast which is extensively employed in the Red Army; it is excellent, especially if combined with sulfa preparations; and negative, if one forgets the wound, its biology, elementary requirements of surgery, and proper dressing of the wound.

Sulfa preparations and closed plaster casts are in reality great achievements of contemporary surgery, but they should not lull the vigilance of the surgeon. The timely removal of the plaster cast, control of the wound, at times additional dressing, assure a satisfactory result even in such cases as complicated fractures of the femur.

Professor Yudin, one of the most ardent propagandists in the U.S.S.R. for the application of sulfa preparations and closed plaster casts, made a critical analysis in one of his reports on the results of their application. In treating complicated injuries of the femur, to avoid premature healing of the wound beneath the plaster cast, Professor Yudin suggested the suture of the skin to the deep fascia of the thigh, thus assuring a constant evacuation of pus. The results of the application of this method were invariably favorable. Through this practice all cases considered septic were eliminated, and thus the threat of panosteitis, the new term for the old nomenclature of chronic osteomyelitis, disappeared. This latter term, according to investigations conducted by Davydovsky, does not correspond either morphologically or clin-

ically to the nature of the process in gunshot wounds of the skeletal system.

On the other hand, notwithstanding the excellent results of treatment of complicated fractures of the femur according to Yudin's method, it became apparent that insufficient care of the wound may lead the wounded man into the state called "wound phthisis"; in the old nomenclature by the Russian genius, N. I. Pirogov, "wound phthisis" is not a sepsis, with the characteristic degenerative modifications of the parenchymatous organs; it is a peculiar clinical state in which the wound is as nonreactive as the patient. Degeneration of organs is absent, and atrophy becomes foremost; the blood is sterile and there is leukopenia or a negligible leukocytosis, either with normal or almost normal number of erythrocytes. Locally, in the region of the wound there is absence of tissue reaction with more or less pronounced quantity of pus. Neither blood-transfusion, stimulating remedies, nor vitamin ingestion will produce any beneficial effect; amputation, when finally decided upon, often fails to save the patient. The patient cannot stand the operative trauma; he cannot stand general or local anesthesia; the operation is too late. An analogous picture is presented in injuries of knee and hip joints. Thus the decision as to the necessity for radical surgery is a decision which has not been made at random, but it is the result of countless observations, high hopes, and cruel disillusionment, and of sufficient information as to what has occurred in the past. The plaster cast and sulfa preparations are excellent and invaluable, but only in early and timely application. In accordance with the anatomic form of the injury of the joint terminals, we apply early arthrotomy and excision, and finally amputation, but not during the nonreacting state of the wounded.

Arthrotomy of the knee-joint, as proposed by Yudin, must, in addition to the dressing of the joint, include suturing of the synovial capsule to the skin. A thick cast assures a smooth course, but the surgeon must bear in mind that threatening or manifest osteitis is not going to be checked by arthrotomy. Disillusionment will soon follow, and the otherwise advantageous incision will be of no avail. It is the task of future investigations to discover fully the cause of the state resembling Pirogov's "wound phthisis." Nevertheless, if one remembers the history of surgery of the last World War, this state was rarely recognized; possibly this was due to insufficient knowledge, or else we may think that sulfa preparations and plaster casts are responsible for the condition. I purposely do not mention avitaminosis; everywhere and always, in every war, avitaminosis has existed, exists, and will exist; a single wound may become the cause for its appearance. At the present time the organism of the Red Soldier is no less saturated with vitamins than it was at the beginning of the war, but "wound phthisis" also existed at that time; with the activization of surgical work, with instillation of the principle of specialized hospitals, these states began to decrease and are now encountered less frequently. The plaster cast is examined and corrected at the front base hospital before the patient is sent to the evacuation distributing center whence he is transferred to a specialized hospital. Its application in the system of echelon treatment has a definite place, although it demands further investigations, perfecting, determination of indications and contraindications, and, certainly, constant supervision.

In connection with the above, I wish to state that even before the war, my chief and teacher, the academician Bur-

denko, allotted a great amount of time to the study of the biology of wounds, and his school produced numerous works which established a definite correlation between the clinical course of the wound and the morphology, biology and chemistry of pus.

Undoubtedly clinical practice gives us much; but practice during a period of traumatic epidemic, during a period of war, bespeaks the fact that clinical practice alone is not sufficient.

The division of the process of the healing of a wound into periods or phases, as made by Profs. Girgolav and Rufanov before the beginning of the war, gives the practicing surgeon only general guidance in treatment of the wound. Nevertheless it is necessary, because it indicates what antiseptic measures are to be applied in various types of wounds. In the stage of hydration (first phase of the wound process, according to Rufanov), there must be elimination of everything that might hinder the natural course of the process taking place in the wound, and all remedies accelerating this process are recommended. In the second place, a different arsenal of remedies must be applied. Of course this is merely schematic; the process of a wound cannot be fitted into any two or even more periods or phases, and two different processes, periods, or phases may be combined in one wound. Nevertheless, the surgeon must have a conscious perception of the wound, and it is also obvious that the attempt to discover an objective test in the evaluation of the wound is both valuable and necessary.

The methods of Drs. Pokrovskaia and Makarova are of special interest in this regard. They allow, by means of "prints" of the wound surface, and from the estimation of the cell exudate, judgment of the course of the process, and especially its deviations. Thus, the subsequent treatment finds, as it were, a relatively objective evaluation. This method of evaluation of the wound is widely established in hospitals. On the strength of the above observations, sulfa preparations must occupy a limited space in a definite period or phase. Of great importance in practice are the observations by the authors that the cytological composition of the cell exudate in anaerobic patients is characterized during the first days of the disease by extreme scarcity of formed elements; as a rule, monocytic cells are absent and the complicated microbial association, consisting of suspected anaerobes and various representatives of aerobic microflora, is discovered without any difficulty.

The proposal for a rapid directive diagnosis of anaerobic infection is not new, but in the above form, which studies simultaneously the dynamics of cell reaction and microflora, it is worthy of attention.

RÉSUMÉ

Dans l'armée soviétique l'aide médicale est basée sur les principes fondamentaux: (1) que le soldat blessé doit être soigné aussi proche que possible du champ d'action; (2) traitements préliminaires aux différentes étapes de l'évacuation; et enfin, (3) distribution des blessés aux hôpitaux spécialisés situés aux arrières-lignes.

Les nouvelles règles de traitement sont d'excision réflechie et totale, avec l'interdiction de sutures primaires, d'emploi généreux des sulfamides et de ses dérivés et succadénés, avec attelles plâtrees fermées.

L'auteur étudie la méthode du professor Yudin de suturer la peau au fascia profond de la cuisse afin d'empêcher la fermeture prématurée de la plaie des tissus mous dans les fractures

compliquées du fémur. L'arthrotomie précoce dans les traumatismes du genou, méthode proposée par le professeur Yudin, est recommandée, mais n'oublions pas que ce traitement n'arrête pas l'ostéite.

SUMARIO

El servicio de salud del Ejercito-Rojo está basado en el principio fundamental que la asistencia médica debe ser utilizada tan cerca como posible al soldado en la linea frente de batalla y tratamiento de primeros auxilios en estaciones de evacuación y distribución de casos a hospitales de especialidades en locales resguardados.

Los métodos más recientes en el tratamiento de heridas consiste en cuidadosa excisión, prohibiendo suturas primarias y haciendo libre aplicación de las preparaciones sulfas (sulfanamidas) y en general el uso del molde de yeso (plaster-of-Paris) cerrado.

El método del Profesor Yudin de hacer la sutura de la piel á la fascia profunda (fascia lata) para evitar la union prematura de la herida dentro del molde de plaster-of-Paris, en casos complicados, de fractura del fémur, se presenta.

La artrotomía temprana de Yudin en casos de trauma de la rodilla es muy recomendada aún cuando este tratamiento no impide el osteitis o la "heridatisis" de Pirogov.

Las ventajas en la división del proceso de cura de heridas en períodos o fases según Girolav y Rufanov son indicadas.

Выводы

Основной принцип медицинской помощи в красной армии, это принести ее как можно ближе к сражающимся во фронтовой линии. Лечение начинается сейас-же в станционах евакуации и сортировки. Новый метод лечения ран состоит из осторожного иссечения раны, без зашива, пользованием сульфа препаратами и гипсовой повязки.

Автор так-же описывает методу Юдина в которой кожа пришивается к глубокой фасции для избежения преждевременного зашивания раны под гипсовой повязкой. Раняя артротомия по Юдину рекомендуется, хотя она не всегда гарантирует против развития остеита или "фтизиса"—"раны" Пирогова.

Автор также подчеркивает преимущества деления заживания ран на фазы по схеме Гірголава и Руфанова.

THIS IS YOUR COUNTRY TO HAVE AND TO HOLD

KEEP HER FOREVER SAFE AND STRONG

BUY MORE AND MORE WAR BONDS AND STAMPS

Paint-Splash Cervix in Leukemia

LT. COMDR. MORRIS WEINTROB (MC)-V(S), U. S. N. R.
U. S. NAVAL HOSPITAL, ST. ALBANS, L. I., N. Y.

MODERN medicine has become in great part a maze of "laboratory" investigations demanding of our present day doctors an exhaustive background of preliminary instruction in the basic sciences and refinements of "technic" in order to grasp intelligently the whys and wherefores of icteric index, fragility tests, Rh factor and other added niceties to the field of diagnosis and therapeutics. And yet, there is still much to be obtained from the use of our five primary senses—sight, smell, touch, hearing and taste. Many systemic diseases can be detected by their manifestations evident on the skin, in the mouth, in the vagina and within the confines of the rectum.

The purpose of this short paper is to call attention to a finding in the cervix that may lead the general practitioner and those engaged in the fields of obstetrics and gynecology to suspect the presence of a possible leukemia.

Nowhere in the literature was there any suggestion encountered that hinted at such a possibility. This brief contribution is offered in the hope that others may be on the alert for further instances of this manifestation and thus a definite "cervical sign" be established that will be of assistance in the more frequent recognition of leukemia. It is not a routine matter for general practitioners and gynecologists or obstetricians to order complete blood counts. The observation of a "paint-splash" appearance in a cervix might point the way to such a procedure.

In December of 1942, while reading an article by Felsen[1] entitled: "The Sigmoidoscopic Diagnosis of Systemic Diseases," his use of the term "paint-splash" was most arresting. More striking, however, was the association of leukemia with the appearance of the mucus membrane of the rectum to which he had applied that descriptive term. Felsen's description was as follows: "Focal areas of intramural, myeloblastic infiltration usually progressed to necrosis and ulceration with superimposed secondary infection. The ulcers were usually discrete, irregular in shape and ragged in appearance.

"The intervening mucosa was the seat of punctate and confluent or 'paint-splash' hemorrhages. The latter term indicates the resemblance to red paint splashed against a smooth, light-colored background by the flick of a brush."

In sigmoidoscopic examination Felsen found it valuable to employ green and red filters and a magnifying telescope. He stated that in the rectum rather suggestive signs were usually present in the acute forms of both the myeloblastic and lymphoblastic types and even in some instances of aleukemic leukemia.

The acute lymphoblastic leukemias, seen chiefly in younger age groups, exhibited marked diffuse hypertrophy and hyperplasia of the lymphoid apparatus of the intestinal wall—with or without hemorrhages into the mucosa.

Rectal bleeding is sometimes the first symptom noted by a patient otherwise completely unaware of an existing leu-

kemia. Hence, the sigmoidoscope may give the earliest clue to the diagnosis.

Occasionally, intestinal lesions may appear before the typical hematologic or sternal puncture findings. In these cases, however, there generally occurs an antemortem rise in immature cell forms of the myeloblastic or lymphoblastic series to approximate the classical hematologic picture of leukemia.

Felsen sums up as follows: "If present, the triad of myeloid metaplasia of the lymphoid tissue, discrete ulceration and 'paint-splash' hemorrhages are of diagnostic significance. These are noted particularly in the fulminating type which runs a rapid course."

Several years ago, a girl of 15 was brought to the writer's office for treatment of a pelvic discharge. Her hymen was sufficiently patent to permit of the safe introduction of a virginal speculum.

Examination of the vagina was essentially negative. A discharge was present but was evidently endocervical in origin. Grossly, it bore no resemblance to that associated with gonorrhoea or with trichomonas vaginalis involvement. The cervix, however, presented an appearance not previously encountered in the examiner's experience. The anterior aspect was not like that of the usual erosion. It seemed as though a drop of paint had been splashed against it—*red paint.*

Tertiary syphilis at times manifests itself in the cervix, covering it with fairly large, dark red splotches in such a manner as to leave only a few scattered small islands of normally pale mucosa separating the areas of discoloration. This, definitely, was not the picture that met the eye in the young girl's case—nor did she have syphilis.

Beginning from the margins of the external os as a central point, there was a reddish discoloration that was practically continuous. At various sites in this confluent area there was a gradual change either to a pink or bluish red, with here and there a string-like effect seeming to connect the otherwise apparently discrete areas of color variation from the reddish background. The entire, abnormally colored portion of the cervix, extending over about two-thirds of the anterior aspect, faded gradually into the normally pale pinkish-red mucosa of the healthy cervix. Yet, there was a noticeably distinct line of demarcation. At the time, a notation was made on her case history as follows: "Cervix shows a paint-splash appearance."

Local applications of 10 per cent solution of silver nitrate to the inner aspect of the endocervical canal and over the "colored" area of the anterior aspect of the cervix failed to do more than stop the discharge. The involved mucous membrane retained its abnormally colored appearance.

Not long afterwards, severe nasal hemorrhages occurred. Hospitalization was deemed necessary. A routine blood count revealed an acute form of lymphatic leukemia. Despite repeated transfusions of whole blood, the young girl expired shortly thereafter.

Upon encountering the use by Felsen of the expression "paint-splash," and noting his correlation of the term with leukemia, plus his consideration of such a picture in the rectal mucous membrane as most significant, it recalled to me the peculiar finding in the cervix of the young girl whose history has been given above.

There were, however, two essential differences in the pictures to which the same term had been applied. That in the young girl was continuous, the "paint-splash" appearance deriving from varying modifications of the basic red color that characterized the confluent discolored portion of the anterior aspect of

the cervix. Nor were there any discrete ulcers as described by Felsen in the mucosa of the rectum.

Consideration of these differences led to the following speculations. A variation in lymphatic or vascular arborization might have accounted for the practically confluent picture in the girl's cervix as compared with the punctate and confluent hemorrhages noted in the rectal mucosa. The lack of discrete ulcers in the cervix might be explained by the greater likelihood of infection in rectal mucosa. Or, perhaps, the leukemic involvement of the cervix had not progressed to as advanced a stage as that observed by Felsen during sigmoidoscopy. Then, too, viewing the picture with the aid of red and green filters through a magnifying telescope might have some varying effect upon the visual interpretation.

The cervix receives its blood supply through one or two sets of arteries that branch off from the uterine arteries on each side. After entering the cervical body, these blood vessels ramify extensively. They follow the fan-shaped arrangement of the muscle bundles and are widely separated by the fascicles of the cervical connective tissue. The veins are fewer in number than the arteries. There are no large venous sinuses.

On each side of the uterus is a large lymph vessel. These provide free anastomosis for the flow of lymph between the corpus and the cervix. The lymph vessels of the latter, in turn, form an intimate network with those of the base of the bladder, the perimetrium and the parametrium.

As stated previously, a thorough search of the literature failed to reveal any reference to the use of the term "paint-splash" in connection with leukemia other than that by Felsen. Some interesting references to the cervix and the body of the uterus in leukemia, although without calling attention to the type of picture in the cervix herein described, were found.

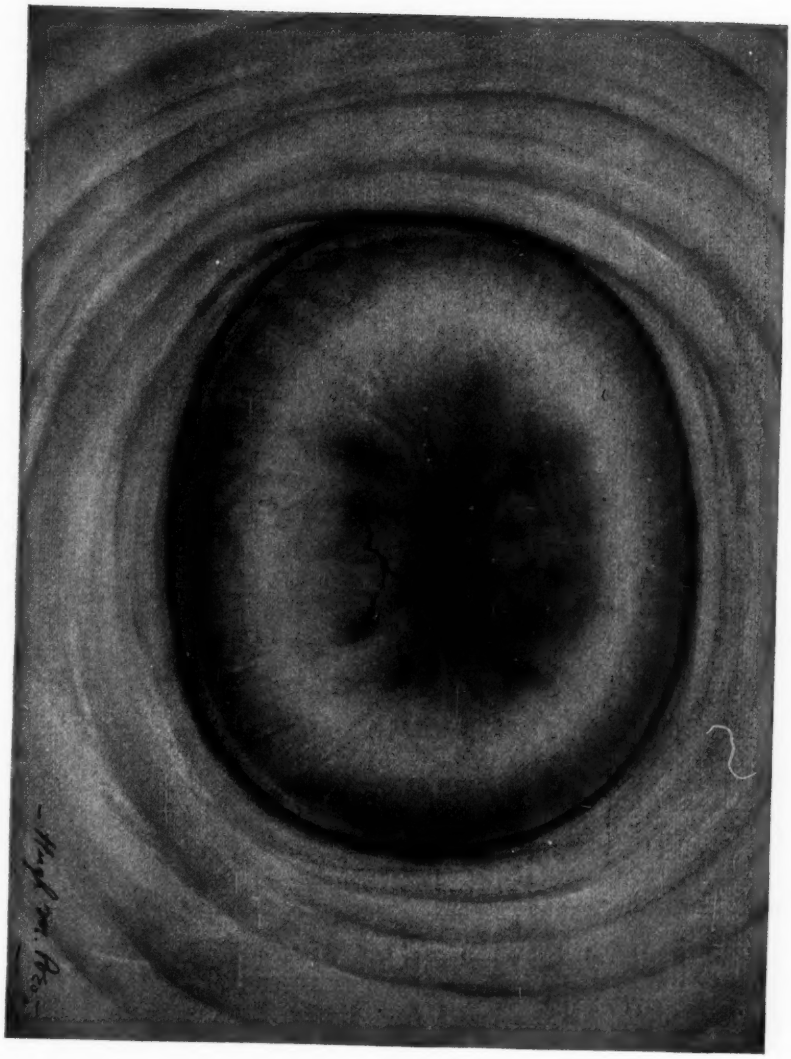
Mac Callum[2] refers to a case in which "there was a lymphoid nodule in the cervix uteri extending to the vagina with ulceration and bleeding. It was at first thought to be a carcinoma; but the autopsy revealed areas of infiltration of lymphoid cells in many of the organs in association with the leukemic condition of the blood."

Of interest in this connection is the extensive tumor-like infiltrations of tissues that may take place in leukemia. Naegeli[3] and others refuse to recognize this tumor formation as anything distinct from lymphoid leukemia. Sternberg,[4] on the other hand, feels that a localized tumor mass developed in some tissue may be the beginning manifestation of the disease.

Such a mass, according to Sternberg, is composed of lymphoid cells that seem to escape into the blood stream, thus giving rise to leukemic alterations of the blood. Mac Callum concurs with this theory. Kaufman[5] calls these "leukemic diffuse or circumscribed lymphomas." He points out that, occasionally, an entire organ may be diffusely infiltrated. Thus, the whole of the uterus may be involved.

Aggressive, tumor-like lymphomas appear more frequently in lymphatic leukemia, especially in the acute form. Numerous nodules encountered in the kidneys, spleen, liver and other internal organs may resemble tumor metastases.

Kirschbaum and Preuss[6] report finding diffuse lymphocytic infiltration at the base of an extensive erosion of the cervix in a case of chronic myelogenous leukemia. They note, in addition, that in a study of 123 fatal cases in a series of 14,400 necropsies for leukemia, 7 instances of ulcerative proctitis and colitis



were associated with the acute stem cell type.

Kermauner[7] submitted the unusual case history of a girl of 15 who died on the twelfth day of her first menstrual period. The cause of death was myeloid leukemia. At necropsy an involuting corpus luteum was observed in one ovary. A description of the endometrium was not given.

Something concerning pregnancy, though not directly related to the purpose of this paper, may not be amiss. Cases of leukemia in parturient women are rare since a lack of fertility and leukemia seem to go hand in hand.

This is fortunate. Should a pregnancy occur during the course of a leukemia, the latter is apparently aggravated. Moreover, the prognosis for the mother is quite grave. According to Kracke,[8] death usually occurs shortly after the delivery.

Although therapeutic abortion is advised by some, if the diagnosis of leukemia has been established early in gestation, it is doubtful whether it has any beneficial effect. Hence, women with leukemia should avoid becoming pregnant.

Since this disease is characterized by a pronounced hemorrhagic diathesis, bleeding may appear quite early from the eyes, the mucous membranes, skin, heart muscle, brain, the lung and its meninges and from the cervix. In the chronic form of leukemia, hemorrhage is far more unusual and is seen only in the advanced stage.

SUMMARY

A peculiar "paint-splash" appearance is described in the cervix of a girl who died from leukemia. A similar, though not identical, picture noted by a proctologist is referred to. The possibility of establishing such an appearance in the cervix as a significant sign in leukemia is presented. An illustration painted in oil to visualize the "paint-splash" sign in the cervix is provided in color.

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RÉSUMÉ

Une apparence de badigeonnage observée sur le col de la matrice d'une jeune fille qui mourut de leucémie est décrite. Une image très ressemblante, observée par un proctologiste, est rappelée. La possibilité d'établir cette apparence du col comme signe important de la leucémie est presentée. Une image colorée de ce cervix accompagne la communication de l'auteur.

SUMARIO

Una apariencia singular del cuello-uterino descrita por el autor como "paint-splash"—"brochazo de pintura"—en una jovencita que murió de leukemia. Un caso semejante, pero no idéntico, es citado por un proctologista, al cual se hace referencia.

La posibilidad de establecer que dicha apariencia en el cuello-uterino sea signo significante en leukemia, la ofrece el autor, con una ilustración en pintura al oleo para visualizar la "paint-splash" o "brochazo de pintura" del cuello.

Выводы

Описывается случай появления особого "красочного пятна" на шейке матки у девушки, которая умерла от лейкомии. Так-же 'сообщается о подобном, но не одинаковом явлении, отмеченном одним проктологом. Возможность появления та-

кого пятна на шейке матки является важным диагностическим признаком лейкомии. В работе приводится иллюстрация "красочного пятна" шейки матки.

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(Continued on page 115)

Shock

CAPTAIN W. M. CRAIG (MC), U. S. N. R.
U. S. NAVAL HOSPITAL, BETHESDA, MARYLAND*

PROBABLY no term in the medical nomenclature of the present day has received such meticulous attention, elaborate explanation, and lack of agreement with regard to its clinical application as the condition which is referred to as *shock*.

We, as surgeons, have long since developed a very high regard for the type of shock which accompanies or follows operative procedures. And those of us who have been associated with an emergency service are far too often aware of the irreversibility of traumatic shock which we see in the accident ward. And so, instead of attempting to analyze the various etiologic factors, I would like to discuss the subject briefly.

The reports of the casualties and their treatment in this war, as compared with those of the last war, seem very significant and reflect great credit on the experimental and clinical investigation of shock.

CLINICAL FEATURES

The clinical features of shock are summed up by Freeman as follows: "The patient in shock has the appearance of being seriously ill. The significant features are centered about the peripheral circulation. The skin is cold and moist, of an ashen grey or cyanotic hue. The pulse is feeble and rapid. There is usually a lowered blood pressure although in the early stages the pressure may not be significantly reduced. The patient presents the picture of weakness bordering on exhaustion. This condition is not sudden in onset and takes time for its development. During the downward course, there is progressive enfeeblement and gradual suppression of all bodily function."

While there is some discussion with regard to the existence of acute shock, the above clinical picture can be seen after severe head injuries, sudden loss of blood, emotional crises, pain, extensive burns and rough handling of injured patients, especially those with fractures. However, the acute reaction may be the manifestation of an already impending condition of shock.

TRAUMATIC SHOCK

In view of the fact that shock of traumatic origin always assumes an important rôle in the treatment of casualties, the present discussion will center about this type of shock.

According to Blalock and Moon, clinical traumatic shock is a circulatory deficiency, neither cardiac nor vasomotor in origin. It is characterized by a decrease in blood volume, reduced cardiac output and hemoconcentration (the latter being the result and not the cause of shock). Blalock assumes that trauma results in a considerable loss of either whole blood or plasma or both, either externally or into the injured tissues.

*The opinions or assertions contained herein are the private ones of the writer, and are not to be construed as official or as reflecting the views of the Navy Department or the Naval Service at large.

An initial decrease in blood volume is followed by an impaired cardiac output, constriction of the arterioles, diminished blood pressure, capillary stasis and cell anoxia. In addition a toxic substance is formed causing dilatation and increased permeability of the capillaries, which allows a loss of plasma and plasma proteins. This condition may progress beyond recovery, and circulatory failure and death ensue.

Regardless of the primary and contributory causes of shock, we are dealing with a condition which involves the circulation of the blood and its physiologic alterations, and the successful treatment depends upon the early recognition and expectant therapy rather than allowing the condition to reach the terminal stages.

Fine, of Boston, at the recent meeting of the *American Surgical Association* reported experiments with hemorrhagic, burn and tourniquet shock. He used radioactive protein plasma.

His evidence contradicts the theory that increased capillary permeability is present—escape of plasma into the injured area is confirmed.

While plasma loss is the significant initiating cause of shock, the irreversibility of the shock state is not due to a progressive decline in plasma volume, but rather to a progressive deterioration of the peripheral circulatory mechanism, characterized by decreased volume and velocity flow through capillaries.

TREATMENT

Just as in malignant lesions we have learned to recognize the advanced clinical symptoms in treating shock, we know that successful treatment depends upon anticipating them before the condition has advanced too far. And similar to those of malignant lesions, many of the classical tests for shock are both late and unreliable. Based upon this assumption, traumatic shock is being treated on the battle-field and aboard ship, in the fox holes and in dugouts without attempting to move the patients.

Morphine is being given for pain, lacerations and fractures of the extremities are being immobilized, and blood, plasma and albumin are being carried to the patient instead of transporting the patient to the treatment. The treatment of shock in this present war is based upon our knowledge that shock develops in so large a number of casualties that anticipatory treatment will be followed by a lowered mortality and a much briefer convalescent period. Shock is more likely to occur in debilitated persons, those who have been living under strain with poor food, inadequate fluid intake and an already abnormal circulation when the trauma is sustained.

It is the consensus of opinion that intravenous fluid replacement is the chief element in the therapy of shock. Wounds should be treated, hemorrhage checked, pain allayed and bodily warmth protected or artificially increased. But shock should be anticipated. Various fluids have been used with variable results. Certain factors are responsible. None of the fluids have been ideal or indicated in all cases. Probably of all the fluids or solutions in use at the present time, human plasma offers the more universal application. A few general rules can be made with regard to the selection of a fluid medium. It stands to reason that casualties who have lost whole blood require whole blood, those who have lost plasma require plasma and those who are dehydrated require normal saline or glucose.

We have learned that patients with extensive burns require large amounts of plasma, and that those having traumatic amputation of a limb associated with excessive loss of blood need whole blood, but that plasma will be of value

in preventing the terminal stages of shock, and transportation can be carried out with greater safety.

Among the solutions, blood and blood plasma have been the most successful, but human albumin has also proved of value and has the advantage of remaining stable in concentrated solution and can be carried in small containers ready for use in the field and aboard ship. Gum acacia has been used in the treatment of shock, but its use is not to be encouraged. Pectin has been tried and in some clinics has been used to advantage. However, while blood substitutes have not proved as successful as blood and blood derivatives, further investigation may throw new light on the subject.

Experimental use of bovine bone gelatin as a blood substitute by Lockwood showed that gelatin having the physicochemical properties of the material used could be safely subjected to clinical investigation in man.

The United States Navy, through its Bureau of Medicine and Surgery, publishes a news letter which carries to all members of the Medical Corps the latest information on various subjects in abstract form. In a recent letter there was a discussion on shock which is quite practical and brief:

Shock—It is too late for prevention when shock can be recognized. Shock treatment should be started early for seriously wounded patients, even in the absence of "prodromal" signs. It is wiser to "block shock" if the injury is severe and if there is evidence of much blood-soaked clothing, bleeding of long duration, burns of large surface, extensive crushed areas, severe dehydration, history of blast injury, exposure to cold, or immersion. Other casualties should be examined at frequent intervals, as time permits, in order to watch for the "prodromal" signs. As the sorting process continues, treatment should be started as indicated and before "typical clinical shock" has occurred. Bear in mind though that intravenous injection or transfusion may dislodge a clot unless hemostasis is known to be complete. This risk usually must be accepted in cases of severe shock.

Every wounded man is in shock to a greater or lesser degree. Treatment should anticipate the "prodromal" signs which are: (1) falling blood pressure; (2) rising pulse rate; (3) abnormal appearance; (4) thirst, restlessness, nausea and vomiting. When "prodromal" signs occur, the blood pressure has already fallen and the patient is in shock to some degree.

When hemorrhage is present, use the quickest method as indicated, such as tying a vessel, pressure or pack, to obtain the most adequate hemostasis consistent with speed.

The tourniquet is only to be used when direct pressure fails to check blood loss. Apply as low as possible. If a limb cannot be saved, do not remove tourniquet until blood or substitute is running into a vein. Otherwise loosen tourniquet, to save the extremity, at intervals not greater than one hour.

Immediate, careful splinting of broken bones is essential as a shock preventive."

Posture. Head down for low blood pressure; exceptions: chest injuries, pulmonary edema and head injuries.

Fluids. Water, hot coffee and tea by mouth, as tolerated, except abdominal injuries and preoperative patients.

If the desired effect on blood pressure is not obtained in fifteen to thirty minutes the dose of blood or blood substitutes should be repeated.

Intravenous salt and glucose are dangerous if used in the presence of head injuries, for if the intracranial pressure is elevated above normal or is rising, it may be seriously increased by intravenous salt or glucose. In pulmonary

wounds salt and glucose solutions are, however, given in large quantities, in the correction of dehydration.

Burns. Plasma best for shock. Two units of plasma in first twenty-four hours *for each 10 per cent of burned body surface.* Repeat dose during second twenty-four hours in average case.

Dehydration Collapse. Cool patient (don't apply cold), give water and salt by mouth. One teaspoonful (3 gm.) salt to glass of water (200 cc.). Then 1 gm. to every 500 cc. water per hour until thirst and temperature approach normal. Use veins if uncoöperative or collapsed.

Heat. Conserve body heat rather than add heat by hot water bottles. Too much heat may cause sweating and fluid loss.

Exposure to Cold and Immersion. Rapid warming by external heat may precipitate shock or death. Place patient in blankets to conserve heat. (Do not warm extremities of a person suffering from immersion foot.) Give hot fluids (tea, coffee) with added sugar by mouth and then later 1000 cc. normal saline with 5 per cent glucose by vein.

A transfusion of blood, plasma or albumin should be under way before external heat is applied.

Analgesia. Morphine (*dose not to exceed one-half grain*). *Severe head injuries should not receive morphine.*

Anesthetics. Avoid, until patient improves. Use local if possible—for major procedures ether is preferable to spinal or intravenous barbiturates.

Rapid, early treatment of shock means saved lives and also economy of labor and materials. By treating the patient as if approaching shock, he is given the benefit of any doubt. The longer shock exists, the more severe it becomes and the more difficult it is to relieve.

SUMMARY

The early recognition and treatment of shock associated with war wounds, either with or without the loss of fluids, has lowered mortality and shortened the period of convalescence.

Clinical shock is characterized by changes of the peripheral circulation, the skin being cold, moist and ashen grey or of a cyanotic hue, and the pulse feeble and rapid. The condition progresses slowly downward and terminates in a gradual suppression of all bodily functions.

Shock associated with hemorrhage should first be treated by hemostasis; in shock associated with pain, morphine and the barbiturates have been of value. Immobilization of fractures, the application of heat and the placing of the patient in absolute quiet are fundamentally important in the treatment of shock. In specific treatment of shock, whole blood, plasma and albumin and blood substitutes are indicated.

The recognition of the reversibility of shock has led to the early administration of blood and blood substitutes on the battle-field and aboard ship prior to the transportation of a patient.

RÉSUMÉ

Il est nécessaire de reconnaître et de traiter le choc accompagnant les plaies de guerres, qu'il y ait perte ou non de fluides. Ce diagnostic et ce traitement précoces ont diminué la mortalité et abrégé la convalescence.

Le choc clinique est charactérisé par des changements dans la circulation périphérique, la peau devient froide, humide et de couleur cendrée ou cyanosée, le pouls est faible et rapide: L'état s'aggrave progressivement et se termine par la suppression graduelle de toutes les fonctions de l'organisme.

Le choc accompagné d'hémorrhagie sera premièrement traité par l'hemostase, le choc accompagné de douleur, par la morphine et les barbiturates. L'immobilisation des fractures, l'application

de la chaleur et le repos absolu sont d'une importance fondamentale dans le traitement du choc. On aura recours à la transfusion de sang, de plasma et de succédanées du sang.

Sur le champ de bataille et sur les vaisseaux la transfusion précoce du sang et de substances apparentées au sang avant le transport du malade a donné d'excellents résultats.

SUMARIO

El temprano reconocimiento y tratamiento de heridas de guerra, con o sin pérdida de flúidos, ha disminuído la mortalidad y acortado el período de convalecencia.

El choque-clínico está caracterizado por cambios en la circulación periférica, la piel húmeda y fría y de color ceniciento o de cianosis y el pulso rápido y débil. Este estado se agrava lentamente y termina en supresión de todas las funciones.

El choque asociado con hemoragia debe ser primeramente tratado por la hemostasis y cuando el choque está asociado con dolor, la morfina y los barbiturates han sido eficaces. La inmobilización de fracturas, la aplicación de calor y asegurando toda quietud y reposo son de importancia fundamental en el tratamiento del choque. En el tratamiento específico del choque, la sangre total, plasma, albumen y sustitutos de sangre pueden ser utilizados.

El reconocimiento de la reversibilidad del choque, ha dado lugar a la administración temprana de sangre y de sustitutos de sangre en el campo de batalla y abordo de navios antes del transporte del paciente.

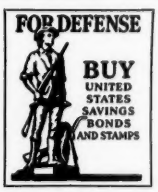
Выводы

Раннее распознавание и лечение шока при ранениях военного времени, как с потерей, так и без потери крови, снижает смертность и укорачивает период выздоровления.

Клинически шок характеризуется нарушением периферического кровообращения; кожа становится холодной, влажной, пепельно серой, или цианотичной; пульс слабый, учащенный. Состояние медленно ухудшается и кончается постепенным угнетением всех функций организма.

Шок с кровопотерей, в первую очередь, требует остановки кровотечения. При болевом шоке ценны морфин и барбитураты. Иммобилизация переломов, применение тепла и помещение больного в абсолютно спокойную обстановку, являются основным при лечении шока. Как специфическая терапия, при шоке показано применение крови, плазмы, альбумина и заменяющих кровь субстанций.

Распознавание шока и борьба с ним привели к раннему переливанию крови и заменяющих ее субстанций непосредственно на поле боя, на борту корабля, перед транспортировкой больного.



THIS IS YOUR COUNTRY TO HAVE AND TO HOLD

KEEP HER FOREVER SAFE AND STRONG

BUY MORE AND MORE WAR BONDS AND STAMPS

The Conservation of Man Power for War*

HAROLD D. CORBUSIER, COLONEL, MED. RES., U. S. ARMY (Inact.)
PLAINFIELD, NEW JERSEY

HUMAN energy and skill are capable of providing the requisite number of guns, planes and ships necessary to equip a gigantic fighting force; however, when it comes to providing the human element, in whose hands to place these tools of warfare, something more than technical skill is required. It is quite obvious that if we are to recruit an army of ten million men from the one hundred and thirty million persons of the country, we will have before us a gigantic task. The men whom we select to handle skillfully produced armament must be more fit physically than those who have done the technical work of mechanical production; yes, the soldier must not only be trained in the handling of the mechanized instruments of warfare, but he must have the intelligence and physical stamina to adapt himself to the many other phases of military life.

In recruiting an army we have followed the precept that a good fighting man must meet certain physical and mental requirements of fitness which classify him as the "pick of the crop." This is the ideal, but, unfortunately, we must admit that parental carelessness and a disinterested public have prevented thousands of young people from developing into the ideal human.

All this being painfully obvious, the question arises, "What are we to do about it?" How are we to produce a physically fit fighting force?

In making requisition upon the man power of the country, we must place at the head of the list the immediate needs of the fighting forces, which, as indicated, require men having perfect physique and mental alertness. Whereas industry involved in war production must also be supplied, it is true that the skilled worker does not necessarily require the physical attributes of the soldier; in other words, industry can draw upon a large portion of our man power not suitable for the armed forces. Many workers are doing excellent technical jobs in spite of hernias, weak feet, artificial limbs and blindness, but these defects would render men unfit for military duty. Of course, we do not mean that all men not perfect shall be forced to relinquish military duty, or that industry should absorb *all* those with physical defects. Quite the contrary is true, as we learned twenty-five years ago. As a result of former experience, we wish to discuss methods by which the armed forces can utilize sub-standard recruits and also retrain many of the unfit and those who have been incapacitated by war.

During the First World War it was clearly demonstrated that men with certain defects could be utilized for "limited service." All the nations involved in the war carried out training programs designed to salvage the unfit to such an extent that they could be assigned to *some* sort of duty with the armed forces. These programs applied to both recruits

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undergoing training and to the sick and wounded convalescents. Of course, the aim was to rehabilitate a man as far as possible, rendering him fit for full duty, or failing that, to give him "limited service" in some category for which his previous training best fitted him. The best work of this sort was begun at Joinville, France, later at various places in England where "re-education companies" were organized with excellent results.

Our own efforts in the salvage of man power during the last war met with enough success to warrant continuation and intensification of the program during the present emergency. The military demands at present are for the training, equipping and transporting of an army which will be superior in fire power to the Axis armies. This program naturally demands the most effective use of all the nation's man power, both the physically fit and the unfit. It is with those men classified as "unfit" that this discussion deals. We will not indulge in theory, but confine our remarks to facts which have developed from actual experience in the original program of military rehabilitation.

In discussing this salvage program we will place the subjects in the following three categories:

1. Rehabilitation of the *selectee* who is known to have possible remediable defects at the time of his induction.

2. Retraining of the *recruit*, the man who was accepted as physically fit, but who failed to live up to the requirements of military life.

3. Retraining of the *convalescent*, the soldier who has been sick or wounded, hence requires a planned system of rehabilitation, both physical and mental.

REHABILITATION OF THE SELECTEE WITH REMEDIAL DEFECTS

Until the beginning of the First World War, the Army accepted only men who were physically fit in every respect, but on passage of the Draft Act it became necessary to accept men who could not live up to peace time requirements. The new law provided for the induction of both the physically fit and those who were capable of performing limited service only. The records show that, of those examined, 31.2 per cent were rejected for full military duty on account of one or more physical or mental defects. However, a portion of these, 8.9 per cent, were admitted on a *limited* basis. At first no stress was laid upon the fact that a considerable portion of the "limited service" group might be rehabilitated to such an extent that they could be made fit for *full* duty. There was no criticism on this score because nothing of the sort had ever been attempted. However, the idea of rehabilitation was not seriously considered until later, when G. O. 45, May 9, 1918, was published, as a result of experiments which had been carried on at Camp Greenleaf, Georgia. This order created "Development Battalions," which were "to relieve divisions and other organizations of all unfit soldiers as soon as encountered and the reclamation of such men, so far as possible, in an organization constructed for that special purpose, thereby leaving the division free to function as a machine, with perfect members." The success of that program can well constitute a guide for action in the present war.

In considering a program for the correction of physical defects it naturally is uppermost in our minds that such an effort is one for medicine to handle. This is, of course, true, but we must not lose sight of the fact that without proper management medicine will not be entirely effective in accomplishing the desired results. Therefore, the program is one for expert medical work, plus proper

administrative supervision and special training. We must also take into consideration the types of cases which will be encountered and can be corrected to a greater or lesser degree. The cases for correction should be men on whom no great chances have to be taken to obtain successful results—those who, according to expert medical opinion, are amenable to treatment. This will include the considerable number of major cases which in civil life the physician always put in the "must" class, such as hernias and chronic appendicitis. However, we have to do with a very large class, in fact, the majority, who are below par on account of some defect which is ordinarily not considered of much consequence by either the family of the youth or the general practitioner. Such conditions as weak feet, hammer toes, poor posture, flat chest, underdeveloped musculature, awkward gait, underweight, overweight, dental defects, etc. In civil life most of these defects are disregarded to a very great extent because the general public has neglected to realize what these things really mean, so we now have on our hands, this enormous section of the countries' man power composed of military "misfits." Their rehabilitation is essential, both for their personal benefit and that of the country.

Some attempt at rehabilitating men in this selectee category, has been attempted to a certain degree by the civilian physician, in the pre-induction period. However, we are convinced that this method is too cumbersome from an administrative standpoint. Moreover, as has been indicated, the problem is not a purely medical one, but requires certain training which can best be carried out under military supervision.

We have been talking physical fitness for years, but no concerted effort has been made to bring it about among our young people. Great stress is laid upon the development of "the team"—the fellows who will represent their schools in competition with others. These young people are a mere handful of the total number of students, but they "get the works"; the rest are neglected to a great extent. The goal in attaining physical fitness should be that state of perfection which would enable a young man to be inducted into the military service with no more preparation than a wash behind the ears.

The public's lack of interest is evidenced in many ways; the young man with weak feet, for instance, has been able to carry on pretty well in these days of highly developed transportation facilities, so no one worried about his partial disability until it became serious. Many weak foot cases have been able to get along pretty well, even on hikes, so "why worry," they say. However, put these same men into military training and they soon discover that the "hay foot, straw foot," under the drill sergeant is quite different from that of a leisurely hunting trip, where one can pick his way and sit down on a log whenever his weak feet become tired. Again, how many cases of poor posture, scoliosis, underweight, shufflling gait, deformed toes, bunions, hammer toes, etc., are now undergoing treatment in civil life? To quote from the records of the last war, "the most important of all defects found in the population of military age, were foot defects." The improvement in such cases is attained, not by just one or two visits to a physician, but by men trained in such work and equipped for it. This includes means for remediable exercises, posture training, etc. However, the most efficient, and less expensive method for rehabilitating such cases is by enrolling them in the Army and assigning them to organizations such as "Development Battalions." If this system were adopted for the "remediable" group, it would

mean the induction of the "selectee" and his immediate, tentative classification in "A," "B," "C," or "D" class. "A" class (tentative) to include that class of borderline cases on which it is difficult to give a positive opinion at the original examination. Examiners are often confronted with this sort of problem. The result is that these candidates are either accepted or rejected, depending upon whether or not the examiner wishes to "take a chance." The tentative "A" class would give the examiner a "break"; we might say, in other words, a place to put his "uncertainties" and test them out. Class "A" (tentative) men would take part in the training program of the soldier, with modifications. Class "B," "C" and "D" should be the groups with *evident* defects, which might be corrected to a greater or lesser extent. If corrected, they would be promoted to a higher grade; if correction were not possible they would remain in their original grade, "rated" as to occupational ability and assigned to "limited service." The tentative "D" class, constituting the greatest problem, would include a few who would be amenable to treatment, that is, to such an extent that they could be promoted to "C" class.. Those not fit for promotion should be placed in a "furlough" or a "reserve" status and returned to industry and agriculture. Such men should be placed in a Man Power Pool, to be assigned where needed.

As an example of the working of the principles involved in Development Battalions, we might cite some of the methods and results experienced at Camp Greenleaf and Camp Meade during the last war.

This work was first undertaken in this country, at Camp Greenleaf, Georgia, as an experiment aimed at retaining in the Army those men who were found to have defects which prevented them from performing the *full* duty of soldiers. It was discovered that many of the defects were of a remediable nature and that it might be worth while to attempt rehabilitation of such cases, by applying methods used in civil life, to men under military control. Most of the cases experimented with at that time were of an orthopedic nature. As an instance of the results obtained in this experimental "Reconstruction Company," as it was first designated, one example might be cited. At the end of April 1918, the company numbered 208 men, most of whom had been under training not less than thirty days. Of these 15 per cent were placed in permanent "A" class and transferred to organizations for full duty: 5.7 per cent were retained in service and classified "B" and "C" and assigned to "limited service" in various camps and even for over-seas duty. The remaining 79.3 per cent in the Reconstruction Company were retained for further training. As better facilities were obtained, results were proportionately better. Percentages of improvement varied in different camps, according to the interpretation of the regulations and the thoroughness of different examiners and training officers.

It is not the intention of this paper to discuss all the details regarding the conduct of that rehabilitation program, but it might be of interest to cite the manner in which the idea was developed. The writer, while Director of the "School of Orthopedics" at Camp Greenleaf, experimented at some length with the problem of salvaging men who would ordinarily have been discharged as unfit, after they had been in military training for various periods. The evident success of this attempt, as observed by the Personnel Division of the Adjutant General's Office, resulted in the issue of G. O. No. 45, May 9, 1918, previously mentioned. This order instituted the formation of the first "Experimental Development

Battalion" at Camp Meade, Maryland.

In organizing these Battalions, not only cases of an orthopedic nature were included, but many other disabilities underwent treatment. Each class was segregated into appropriate companies in order to facilitate treatment and training. As the work progressed at that camp, officers were ordered there for instruction, in order that the method could be instituted in all other large cantonments. Additional material was published in a Bulletin from the A. G. O. designated, "Instructions Concerning Operation of Development Battalions." This Bulletin explained more fully the method of "rating" referred to earlier in this paper, and also gave more detailed instructions regarding the selection of qualified officers for assignment to this duty. Many other phases of the work were also more fully explained in that Bulletin. The system as a whole worked out to great advantage to the Army.

Before proceeding to remarks on the conduct of Category 2, mentioned at the beginning of this paper, I wish to invite attention to another class of cases which were experimented with to a certain extent. These were the malingerers. At Camp Greenleaf a number of such cases were assigned to the "Reconstruction Company" where they could be studied and appropriate steps taken for handling them. The details of that work cannot be given here, but suffice it to say that the experiment resulted in several surprises when some of these men made rather rapid recoveries and actually made applications for full duty.

RECRUIT REHABILITATION

At first glance, it might seem that Category 2 is of no particular importance. However, the writer's experience during Development Battalion work convinced him that we have to deal with a number of men who have "gone under" from too intensive training, or sometimes from the nervous tension incident to the new tempo and environment of Army training. The line officer receives his recruits and naturally considers that they are able to "stand the gaff" of a strenuous training program. Most of them can. On the other hand, there are a certain number who find that they "can't take it," even though they may have passed a perfect physical examination at induction. Those men are not in need of hospitalization and may not even have been marked "quarters" after having reported at "sick call"; nevertheless they are potential casualties and in need of intelligent handling. These cases cannot be cared for to advantage in combat organizations undergoing active training, but should be assigned in a detached status, to a Development Battalion for graduated training. If left in their organization they will probably be marked "quarters" and allowed to sit around for a few days, without having had a true evaluation made of their condition. Such cases are in a similar status to the next category of which we shall speak. However, we place them under a separate heading for the purpose of emphasizing the fact that the "dog tired" recruit is not always given sympathetic consideration.

RETRAINING OF CONVALESCENTS

Referring to Category 3, we invite attention to the importance of gradual retraining of convalescents, men who have been discharged from hospital and are *apparently* fit for duty with their regular organizations. After reports on this phase of the subject had been made to the Surgeon General, the Adjutant General published in "Instructions Concerning Operation of Development Battalions," the following: "Par. 5. In each 'Development Battalion,' arrangements

will be made for giving physical training to such convalescents as may be sent to the Battalion for hardening. Patients who are no longer in need of treatment, but who require hardening before being returned to full duty, may be sent to Development Battalions by commanding officers of Base Hospitals or other proper medical officers. They will be carried attached. At the time they are sent to the Development Battalion, these patients will be returned to a 'duty' status. When in the opinion of the commanding officer of the Development Battalion these men have received the necessary hardening, they will be returned to their organizations."

Pursuant to this enabling order, a large number of the influenza and pneumonia convalescents at Camp Meade were quartered in vacant barracks and underwent very gradual conditioning and retraining. This group of convalescents was assigned to special battalions, not to those organized for the selectee and "washed out" recruits.

It is important for the convalescent to begin occupational therapy and retraining as early as possible in the period of recovery, in order to improve his mental attitude and to shake off the idea of being ill. The initial steps in this work should be undertaken as early as possible, before discharge from the hospital. Of course this retraining should be arranged for surgical, medical and mental cases alike, but with methods appropriate to each class.

The details of convalescent retraining at Camp Meade cannot be taken up at this time, but we can report that the program was a marked success and resulted in the salvage of many men who might otherwise have become chronics and unfit for further service. I wish to emphasize the fact that there is no place in a convalescent retraining program for the pugilistic type of conditioning. This is undoubtedly quite appropriate to the training of Commandos, but will only be detrimental to the convalescent patient and even to the early stages in training of the physically fit recruit.

We cannot close without laying stress upon the importance of a long-range program for the improvement of the physical condition of our youth throughout the entire country. It seems that such a program should be instituted by national organizations already functioning to a greater or lesser degree. Not meaning to decry the importance of sports and athletic competitions, we must at the same time lay emphasis upon general physical development for all youth, not just for those being groomed to take part in athletic events. The popular idea of the acme of physical fitness is the production of athletes for competitive contests. This desire to train "winners" comes down through the ages and should not be abandoned, but why give all the attention to the select few? We need mass winners! A nation-wide program for physical fitness might well have set for it the example of the well organized Development Battalion.

CONCLUSIONS

In the recapitulation of this paper, we wish to emphasize certain points which it seems should enter into a definite program for the salvage of man power for the war effort, the opinions given having been arrived at as a result of original work in rehabilitation done during the last war. (a) Formation of Development Battalions in the military service to absorb cases of a nature which experience has shown can best be handled in organizations where physical training is the major requirement, coupled with medical, surgical and dental treatment: this method to be carried out to the extent that it will retain in the armed forces every man who can be

fitted into some essential activity. (b) To return to industry, men whose physical condition and general aptitude make them military misfits. (c) The meticulous retraining of convalescents discharged from hospitals, and those soldiers who have developed symptoms from overtraining, etc., but are not fit subjects for hospitalization. (d) Institute a long range program of physical fitness for the youth of the country by interesting the general public in the great importance of training young men "fit to fight."

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RÉSUMÉ

L'auteur présente un programme pour la conservation de la main-d'oeuvre. Ce programme embrasse les conditions suivantes: (a) La formation de bataillons de développement parmi les hommes en service afin d'absorber tous les cas que l'expérience a démontré qu'ils possèdent les capacités essentielles d'organisation. Ces hommes après examens médical chirurgical et dental, seront retenues jusqu'à temps qu'ils puissent être placés dans l'industrie. (b) Licensier tous ceux dont l'état physique ou l'aptitude générale sont impropres au service militaire. (c) L'entraînement méticuleux des convalescents relâchés et de ces soldats qui montrent des symptômes de surmenages, mais dont l'état général ne demande pas qu'ils soient internés dans un hôpital. (d) L'adoption d'un programme détaillé pour l'entraînement physique de la jeunesse du pays. Il faut que le public comprennent l'importance de préparer nos jeunes gens pour la lutte et pour la défense nationale.

SUMARIO

El autor presenta un programa para la conserva y el poder físico de tropas de guerra y consiste de los requisitos siguientes:

(a) La formación y desarrollo de Batallónes en el servicio militar que absorban los casos que la experiencia ha demostrado pueden ser manejados en las organizaciones de instrucción y ejercicio físico junto con el tratamiento médico-quirúrgico y dental, este plan practicado hasta el punto de conservar en las fuerzas armadas los individuos que pueden ser utilizados en actividades esenciales.

(b) Devolver a las industrias aquellos cuyas condiciones físicas y aptitud general no son de calidad militar.

(c) Escrupulosa instrucción de los convalecientes que han sido descargados de los hospitales, lo mismo que a los soldados que han desarrollado síntomas resultantes de los ejercicios e instrucción militar, pero que no necesitan hospitalización.

(d) La institución de un largo programa de condición física de la juventud, interesando al público en la importancia del desarrollo y cultivo de la juventud "capáz para el cambate."

Выводы

Представляется программа по сохранению здоровья мужчин годных к военной службе.

Она охватывает следующие пункты: а) формирование тренированных военных батальонов охватывает случаи такого по-

рядка, которые, как показал опыт, лучше передавать в организации, в которых физическое упражнение является главным условием подготовки, соединяющейся с терапевтическим, хирургическим и зубоврачебным лечением; этот метод должен применяться с целью сохранения каждого человека для армии и возможности использования его в какой-либо определенной деятельности. б) Возвращение мужчин на производство, физическое здоровье которых делает их непригодными для военной службы. в) тщательная подготовка и переподготовка выздоравливающих, выписывающихся из госпиталей и т. д. г) Подготовка обширной программы по физическому воспитанию молодежи страны с привлечением общественности к вопросам обучения молодежи под лозунгом "быть готовым к борьбе".

(Continued from page 102)

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DUES EXEMPTION FOR THOSE ENGAGED IN ACTIVE MILITARY SERVICE

At the meeting of the United States Chapter of the International College of Surgeons held in Chicago on March 30, 1941, it was unanimously agreed by the Executive Council that Associate Members, Members and Fellows of the International College of Surgeons are exempt from payment of dues during the period of active military service.

War Wounds of the Skull and the Brain

FRANZ A. COLMERS, M.D.
NEW YORK, NEW YORK

IN 1906 Von Zoege Manteuffel[50] reported his sad experiences with conservative treatment of tangential gunshot wounds of the skull during the Russian-Japanese War. He was the first to urge the early operative treatment of these head injuries, contrary to general practice. My own experiences in the same war corroborate him completely. The small number of soldiers with serious head injuries who reached the German Hospital in Harbin after a long time died, all because of their desperate condition on arrival. Similar observations were made in the other Russian Hospitals of Harbin.

In the Bulgarian-Turkish War (1912-1913) I lost in Sofia 70 per cent of all tangential gunshot wounds of the head with injury of the brain due to severe infection, in spite of operative open treatment. Clairmont[13] suggested in 1913 the complete closure of gunshot wounds of the skull after careful excision and removal of bone fragments. At the beginning of World War I, during the siege of Przemysl, Barany[4] successfully closed tangential shot wounds of the skull in soldiers who were operated on only a few hours after being wounded. Cushing[19] two years later achieved the same good results with primary closure of these gunshot wounds of the skull.

During World War I the need of early operative treatment of all gunshot wounds of the head was accepted. Primary closure of the wound was considered desirable whenever external conditions permitted, but probably will not always be possible, even at the present time. While working in a German field hospital only six miles behind the Russian front during World War I, I never succeeded in performing a single primary closure of gunshot wounds of the skull because of late admission of the injured and gross soiling of the wounds.

In wartime, injuries of the skull are frequent. Percentages for recent wars are given below:

	Per cent
Franco-Prussian War	16.2
Russo-Japanese War	
Russian Army	21.0
Japanese Army	29.5
World War I	
German Army	14.4

The 14.4 per cent listed for World War I included 2.7 per cent of skull injuries with and without damage of the brain, 6.3 per cent injuries of the soft tissues and 5.4 per cent injuries of the face.

The decrease of the number of gunshot wounds of the skull in World War I is due to the use of the steel helmet. It has practically abolished all shrapnel injuries of the head. Against small caliber projectiles and small fragments of high explosives the steel helmet is effective only under favorable conditions (spent missiles, tangential hits). Lauwers[36] reported that the occurrence of head injuries in the French army decreased from 15 per cent to 3 per cent following introduction of the steel helmet.

It may be assumed that at least 25 per cent or more of all skull and brain injuries prove fatal on the battle-field. The treatment of the surviving 75 per cent will be discussed in this paper.

Gunshot wounds of the head may be divided into:

1. Grazing shot wounds
2. Tangential shot wounds
3. Segmental shot wounds
4. Diametric shot wounds
5. Shot wounds with retained missiles
6. Ricochet shot wounds

The grazing shot wounds, with injuries of the soft tissues only, nevertheless have to be watched carefully because experience has shown that the *tabula interna* of the cranium may be injured without any perceptible periosteal or bone injury. Formerly this kind of gunshot injury was denied by a number of authors, but it was repeatedly observed during World War I. I was probably the first to observe this type of injury during the Bulgarian-Turkish War.[18]

The case was a shell fragment wound with retained missile and semi-lateral paresis. After excision of the wound and removal of the missile, the periosteum and the bone appeared to be completely normal. Nevertheless the clinical findings made me trephine the skull. I found, exactly corresponding to the external lesion, a fracture of the tabula interna the size of a quarter, from which a bone fragment had penetrated into the brain and caused a subdural hematoma. The patient recovered completely.

In the reports of head injuries during World War I, many authors emphasized the possibility of brain injuries with apparently trivial scalp wounds (Cushing,[19] Jefferson,[32] Chabrol[11] and others). The Medical Department of the U. S. Army mentioned in its report: "Every scalp wound, no matter how trifling, is a potential penetrating wound of the skull."

The same experiences proved true in this war. McKissock and Brownscombe[38] report such apparently trivial head injuries which they have observed after air raids in London. Among fifty-three cases were many with scalp wounds, but none with fractures of the skull. Yet abnormally raised or lowered intracranial pressure was found in 19, blood was present in the cerebrospinal fluid in 16, 41 (77 per cent) showed abnormal physical signs referable to the central nervous system. O'Connell[42] saw four cases of brain abscess among 250 head injuries mostly caused in air raids. Two of the four arose because what were in reality penetrating wounds of the cerebrum had been regarded as trivial scalp wounds at first aid post or hospital.

The diagnosis of injuries inside the cranium without fracture and lacking positive symptoms may prove to be extremely difficult. Abbott, Due and Nosick[1] recently reported on ten cases of subdural hematoma and effusion due to blast. In this series, definite neurologic findings have been infrequent or minimal. Repeatedly diagnoses of psychoneurosis, war neurosis and traumatic neurosis had been made. In the experience of the authors careful psychiatric examination with the use of specialized psychologic testing has been more successful as an indication for pneumo-encephalography than the usual neurologic criteria. Also the electroencephalogram may prove helpful with doubtful cases in localizing subdural hematomas, as shown in the case of Rogers.[45]

I have quoted these references in order to emphasize the importance of a most careful examination of every head injury, even apparently trivial ones, and of continued medical observation.

Tangential shots of the skull always

produce a furrow-like wound of the soft tissues and the bone (gutter type). The brain is always affected by the missile itself or by bone fragments driven into the brain. The extent of the brain injury varies but is mostly widespread. The bone fragments are usually small and numerous. They may lie in the surface or may be driven deep into the brain.

With *segmental and diametral gunshot wounds* the wound of exit is usually larger than the wound of entry.

Retained missiles are very seldom rifle projectiles (only those spent from very long distance). In most cases they are shell fragments. Shrapnel can almost entirely be excluded since introduction of the steel helmet.

A *ricochet shot* has so little force, that in most cases it is not sufficient to penetrate the helmet and enter the soft tissues. It results in a more or less serious contusion. The missile gets stuck in the helmet or drops to the ground. Nevertheless the ricochet shot may have sufficient force to cause an injury of the tabula interna as described above with the grazing shots. It may also be strong enough to cause a concussion, an epidural or subdural hematoma.

According to the experiences of World War I, about 40 per cent to 50 per cent of the gunshot injuries of skull and brain were fatal. About 30 per cent succumbed early, partly due to the seriousness of the injury, partly as a consequence of primary infection. About 20 per cent died from delayed complications. Kennedy[35] even assumed that the average mortality rate of skull and brain injured in World War I was more than 60 per cent. At the start of his work in France, Cushing[19] reported a mortality rate of 54.4 per cent which he succeeded in cutting down to 28.8 per cent.

The Medical Department of the U. S. Army has reported head injury mortality rates as follows: (Percentages given are approximate.)

Wounds of the scalp, 5 per cent.

Cranial fracture without dural penetration, 10 per cent.

Cranial fractures with depression and dural penetration, but without extrusion of brain, 20 per cent.

Wounds (usually gutter type) with brain extruding and indriven fragments of bone, 30 per cent.

Wounds usually of penetrating type with indriven bone fragments plus metal, 40 per cent.

Wounds of type 4 and 5 opening cerebral ventricles, 50 per cent.

Craniofacial wounds in which the ethmoidal or petrosal sinuses are opened making primary closure impossible due to the risk of secondary infection, 60 per cent.

Perforating or traversing wounds, 70 per cent.

Extensive bursting fractures, 100 per cent.

The mortality rate in this War is expected to be much lower, partly as the result of the experiences in World War I, partly due to the use of sulfa drugs. Although no statistics have been established so far, the reports published are hopeful. David and Ferey[20] treated 389 skull and brain injuries in the neurosurgical center of the Second French Army in May-June 1940, 288 of them having been operated on. Of these 288 cases, 28 (10 per cent) died. Twenty of these 28 suffered from fungus cerebri. Of 83 cases of fungus cerebri, 24 per cent died. These mortality rates are strikingly low compared to those of World War I. Ackland's[2] reported mortality rate of 50 per cent in this War may be ascribed to the small number of cases (38). The bad results may also be blamed partly on unfavorable facilities of transportation.

Of the surviving patients with skull and brain injuries from World War I, very few have recovered completely. Most of them remained invalid and were

endangered even after many years. For this reason every patient with skull or brain injuries has to be considered as permanently disabled for military service, in spite of favorable clinical findings and apparent well being of the injured. All of these cases require careful and regular observation for years.

Those injured with retained shell fragments require special carefulness because an injury of the brain may be easily overlooked. I have seen a number of patients in apparent good health for many months suddenly develop acute encephalitis or brain abscess and succumb in spite of operation.

Every gunshot wound of the skull has to be regarded as primarily infected. The germs are driven into the brain together with foreign bodies such as hairs and bone or shell fragments. By early operation with subsequent closure of the wound, developing infection may be prevented. But "early" is by no means "immediately." The experiences of World War I have shown that operations of the skull and the brain should only be performed by surgeons specializing in brain surgery and in a hospital specially equipped for this purpose. Furthermore, the patient should be allowed to stay under the care and supervision of the same surgeon for at least three weeks. The special equipment of these hospitals should consist of the very best x-ray machine (stereoscope, tomograph), suction apparatus and a strong electromagnet. The medical staff must not only be fully trained in surgical care but must also be expert in ophthalmoscopic, neurologic and psychiatric examination. Already in World War I Cushing[19] claimed and established specialized hospitals for brain injured. Since then this claim has been fully acknowledged and accomplished in the Spanish Civil War as well as in this war. Of course these hospitals cannot be established near the front line. They will very often have to be far behind it.

This is touching upon the problem of transportation of skull and brain injured. Already the experiences of World War I have proved that patients with skull and brain injuries will stand long transportation relatively well after first aid treatment and provisional dressing. This has been confirmed in the reports of the Medical Departments of all nations. Recently Mitchell[41] reported the same experiences from Libya. On the other hand, transportation of patients within the first days after brain operation has proved to be dangerous. Most of them died. Ducuing[22] and his collaborators in their reports from the Spanish Civil War bluntly state a mortality of 100 per cent under these circumstances.

In World War I every case that reached the hospital within the first twelve hours after the injury was regarded as suitable for operation (primary closure of the wound). But there also are reports of successful treatment with débridement and primary closure of a few cases having reached the hospital after twenty-four hours. In this War with local, peroral and intravenous treatment with sulfonamides at our disposal the pre-operative interval might even be prolonged.

The importance of early operation necessitates the routine of selection of all patients with skull injuries at the Casualties Clearing Station for quick transportation to the next neurosurgical center. In this war the transportation of these injured by airplane has proved most helpful (Toennis[47]). This method of transportation has increased the chance of survival of even the most serious cases. It must be emphasized, however, that open brain injuries do not well tolerate altitudes above 5000 feet (Coleman[15]). Special care is indicated with injured who have

been treated with sulfonamides. Foster Kennedy[35] warns of air transport at high altitudes because of the danger of sudden death caused by lack of oxygen. Therefore it is imperative to have oxygen available for those patients with brain injuries even at altitudes where other injured can do without.

Treatment of gunshot wounds of skull and brain. The general rules of the first treatment of head injuries need not be mentioned. Every head injured has first to undergo a thorough x-ray examination. Shell and bone fragments have to be located. The scalp has to be shaved completely. Especially with wounds caused by shell fragments, the points of entry are frequently so small that they do not bleed and may easily be overlooked. The shaving may necessitate ethyl chloride inhalation particularly with restless patients. The anesthesia of choice with all head injuries is local anesthesia. In a recent paper by Miller[40] pentothal sodium given in glucose and saline solution by the continuous drip method is recommended as the best anesthetic agent. A single injection may be useful during the painful shaving of the scalp or introduction of novocaine under which the operation may be completed.

According to my own experiences the excision of the wound with curved prolongation of both ends in opposite directions, if necessary, has proved most satisfactory. A similar incision the shape of a reversed S has recently been recommended by Lockwood.[37] The technic established in 1918 by Cushing[19] is still used. He prefers the tripod incision whereas with French authors the osteoplastic flap is the method of choice (Garcin and Guillaume,[24] Cairns[9] and others). With small wounds Cushing[19] preferred the removal *en bloc* rather than piecemeal of the area of cranial penetration. For the removal of the disorganized brain he availed himself of the suction method with a rubber catheter, thereby cleansing the track of the pulped or devitalized tissue whose retention, as is the case with dead tissue anywhere, favors infection. Horrax[30] and Garcin and Guillaume[24] recommended electrocoagulation to stop bleeding and for the removal of the necrotic tissue later by suction. Metallic foreign bodies may be removed by an electromagnet, using a French wire nail to contact the missile, a method already recommended by Cushing.[19] Heller[28] in his report from the beginning of this war recommended the use of a giant electromagnet for the removal of projectiles.

The dura mater has to be carefully closed with fine silk sutures. A defect of the dura may be closed by transplantation of fascia lata. David and Ferey[20] emphasize the use of amnion membrane instead of fascia lata. Chao, Humphrey and Penfield[12] recently likewise recommended amnion, especially the inner membrane of the amnion, which can easily be prepared and conserved. This material prepared according to their prescriptions is called "Amnioplastin." "Amnioplastin remains a foreign body for a short time but is completely absorbed within a period of thirty days and prevents the formation of adhesions." Also Cloward,[14] who reported his experiences at the bombardment of Hawaii, recommended the complete closure of the dura with clean wounds, whereas Guleke[27] never closed the dura and Broster[8] considered the repair of the dura as unsafe. Personally I believe the closure of the dura, with or without transplantation, to be very important in clean cases in order to prevent adhesions and consecutive epilepsy. Anyway, closure should always be attempted. The galea has to be closed with interrupted fine silk sutures, the scalp wound likewise in two layers. Before closing, dust-

ing of the wound with sulfonamides is highly recommended (Broster,[8] Garcin,[24] Horrax,[29] Kennedy,[35] Grant[26] and others).

With tangential wounds the injury of the brain is mostly extensive but superficial, with numerous frequently very small bone fragments. After excision of the scalp wound the whole track has to be exposed. The opening of the skull is widened on both sides in order to expose the edge of the dura all around to an extent of a quarter of an inch. The visible bone fragments are removed first, the deeper embedded ones have to be carefully palpated with the finger or the Cushing catheter before removal. The wound is then treated as described above.

Several surgeons recommend primary osteoplastic closure of the bone defect. I believe that this closure, even in infected wounds, should be performed only after recovery and after one year at the earliest.

If tangential wounds are infected or reach surgical care only after a couple of days, the procedure is similar. I used to apply a loose packing with vaseline gauze after excision of the soft tissue wound, widening of the bone defect, careful removal of all bone fragments and of the devitalized brain tissue. Before packing, the wound has to be dusted with sulfathiazole or sulfapyridine. The first packing should remain as long as possible in order to secure good granulations. The danger of open treatment of brain wounds is secondary brain abscess, which may be expected in about 20 per cent of all cases, according to the experiences of World War I. Formerly, it was fatal in most cases.

On the experiences of treatment of open brain wounds with sulfonamides, reports from this War have already been published. The results may be expected to have greatly improved. The local treatment with sulfonamides, however, seems to be only successful following surgical treatment. Miller[39] who reported his experiences in a neurosurgical center in the Western Desert Campaign (Middle East) mentioned that undoubtedly the early oral administration of sulfonamides saved many patients with bizarre brain injuries who otherwise could not have survived. But he adds that scalp wounds packed with sulfonamide powder became infected and healed very slowly. Jefferson[33] considered the sulfapyridine to be exceptionally useful in the cranio-facial injuries. David and Ferey[20] have applied sulfonamides as a routine in the postoperative treatment of all brain cases: 6.0 gm. every day the first two days; 4.0 gm. the next two days; and 2.0 gm. the last two days. The strikingly low mortality rate of 10 per cent in 288 operated cases mentioned above may be ascribed to this medication. Cloward[14] recommended generous use of sulfonamides, not only in the scalp and skull wounds but in the missile tract of the brain. So far as can be judged, peroral and intravenous treatment with sulfonamides should be administered as a routine pre- and postoperatively in all cases of brain injury.

Complications. Almost all skull and brain injuries are connected with unconsciousness of short duration, which sometimes extends into hours and even days. Long lasting unconsciousness will always make the prognosis more serious. Amnesia, typical for commotion, is never observed with gunshot wounds of the skull except with grazing or ricochet gunshots to which the brain reacts as to a strong blow.

One of the most important complications with fresh gunshot wounds of the brain is *intracranial pressure.* It is to be expected after every brain injury and brain operation. Intracranial pressure

may be raised by hemorrhage, the entrance being obliterated by blood clots which block the discharge of blood. The most important cause of intracranial pressure, however, is the increase of liquor following the trauma emphasized by Payr,[43] who called it *"Meningitis serosa acuta traumatica."* He believes that the trauma in itself irritates the plexus choreoidei and liquor-forming organs and thus causes an acute tidal wave of the cerebrospinal fluid originating together with the traumatic edema of the brain. The physiologic regulations and the relieving trephining caused by the gunshot may be responsible for the fact that the raised intracranial pressure does not always show.

The clinical diagnosis of raised intracranial pressure is made by ophthalmoscopy and by spinal puncture. Spinal puncture particularly and measuring of intracranial pressure should be performed with all gunshot wounds of the brain. According to my experiences, it proves most helpful not only as a diagnostic but also as a therapeutic procedure. Clean brain injuries with intracranial pressure may be cured with spinal puncture repeated twice to three times a day.

Intracranial pressure may also be lowered by intravenous injection of hypertonic 50 per cent glucose solution and by injection of caffeine sodium benzoate. A very recent method highly recommended is intravenous injection of concentrated serum by adding of 40 cc. sterile water to the dried solids obtained from 200 cc. of human serum. Turner[48] has used this method in six cases of closed brain injuries and was able to prove the decrease of the pressure in the cerebrospinal fluid in five of the six cases. The clinical results, especially relief of severe headaches, were satisfactory. Regulation of fluid intake and elimination of fluid by the bowels should also be considered for the purpose of lowering the intracranial pressure. Payr[43] recommended the puncture of the corpus callosum in all cases of failure of spinal puncture and reported excellent results.

It need not be mentioned that every brain injured has to undergo a thorough neurologic and psychiatric examination. It is a striking fact that even most serious brain injuries very often will cause but slight symptoms, especially when the frontal part of the brain is concerned. Widespread paralysis immediately following injury will frequently be seen to decrease to a wide extent. On the other hand, new symptoms of paralysis may occur after some time and disappear again. Motor aphasia will frequently be observed. Also sensory aphasia will occur after gunshot injury of the brain. Disturbance of vision is frequent.

Another complication of brain injuries, especially after open treatment, is infectious encephalitis. Occasionally it may remain localized, but may also develop into a brain abscess. Even after apparent recovery encephalitis may flare up again and become fatal. Encephalitis is frequently connected with fungus cerebri, as the following case shows.

CASE REPORT

A private, aged 29, suffered a head injury by shell fragment on Mar. 9, 1916. He was operated on in a base hospital on Mar. 16. He was discharged as recovered May 30, but had to be readmitted after three days because of headache. On July 3 he was transferred to the military hospital of his home town. Because of continued headaches and temperature an incision in the old scar was made Aug. 7 without result. Three days later x-rays revealed a small foreign body in the brain. Temperature continued high until Aug. 25. The patient was out of bed on Sept. 7 and in apparent good health. A slightly draining small sinus is located near the previous

entrance of the missile. Because of sudden intense headaches and vomiting with high temperature on Jan. 25, 1917, the patient was admitted to my hospital. The examination revealed several radiating scars and a small slightly draining wound in the right temporal region. Under the firm scar tissue a bone defect of about 1 in. diameter was palpable. The patient was dizzy, the pulse very slow (46) and irregular. The x-ray film revealed a small shell fragment located not more than three-quarters of an inch inside the brain. In local anesthesia the scar was excised, adhesions with the brain were severed, the bone defect was widened and a small brain abscess containing the shell fragment was opened. The symptoms of meningitis increased after the operation and the patient succumbed in coma on Jan. 31, 1917. The autopsy revealed an extensive meningitis of the convexity and the base of the brain. The conserved and dissected brain showed a scar reaching the ventricle, encephalitic changes of its surroundings and perforation into the ventricle, distorted in the direction of the scar. Both ventricles were filled with pus.

In this case, more than ten months had passed between the injury and the fatal end. A primary infectious encephalitis caused by a small shell fragment flared up repeatedly and finally developed into acute meningitis.

Fungus cerebri is a consequence of raised intracranial pressure and may occur soon after the injury. Fungus cerebri should not be operated on, since results recorded during World War I have been highly unsatisfactory. In the present war these experiences have been confirmed by David and Ferey,[20] who lost three cases of infected fungus cerebri succumbing to meningitis within a week after operation. Guleke[27] in this war reported a mortality rate of 44.5 per cent in 78 cases treated for fungus cerebri. On the other hand, excellent results with conservative treatment (posture, dehydration, spinal puncture, chemotherapy) have been reported by O'Connell.[42] Among 250 cases of air raid injuries, he observed and cured 11 cases of fungus cerebri. Miller[39] successfully treated with sulfonamides 4 out of 5 cases. Thus, conservative treatment with sulfonamide, and reduction of intracranial pressure as mentioned above has proved to be the method of choice with fungus cerebri.

The early brain abscess mostly develops with gunshot wounds of the brain not recognized or with those not primarily closed by operation. It particularly develops around foreign bodies (hair, bone or shell fragments). The abscess usually shows up within the first two weeks after injury and is always associated with fungus cerebri in all cases of major defect of the dura mater. In World War I most of the affected succumbed. The following observation seems to be significant.

CASE REPORT

A sergeant, aged 25, having been wounded on Aug. 14, 1916, in the battle of the Somme (France) was transferred Aug. 18 to the military hospital of Coburg (Germany). Three days later, a week after the injury, he was transferred to my hospital for operation. He suffered from a retained shell fragment shot wound in the right lower occipital region. The missile had been removed at the Collecting Station. He was dizzy, but had no temperature. The vision was distinctly impaired (diplopia). The left pupil was larger than the right one and reacted much more slowly. The lower part of the scar showed a sinus through which movable bone fragments could be palpated by probing. Incision of the scalp shows a lesion of the right occipital bone. After removal of the bone fragments a lesion of the dura could not be proved. As the condition of the patient got worse and unconsciousness developed, he was operated on once more a week later. The bone defect was widened to a 1 in. diameter. A very small opening of the dura which was discharging pus became visible. The dura and a superficial abscess of the brain were opened. Five days after the operation a serious venous

hemorrhage occurred, which was controlled by packing. Uncomplicated recovery followed. On Sept. 29, 1916, about six weeks after the injury and four weeks after operation on the brain abscess, the patient was discharged as completely recovered.

In this case the injury had been caused by a retained shell fragment causing a fracture of the right occipital bone with depression. The surgeon who first operated on the injured man removed the shell fragment, but overlooked the bone lesion. When I operated on him the first time, I found the bone lesion and removed the bone fragments, but in spite of existing brain symptoms I could not make up my mind to open the dura. Only after extensive widening of the bone defect the second operation revealed a small lesion of the dura apparently caused by a pointed bone fragment with subsequent superficial brain abscess. This case history demonstrates the importance of careful examination of injuries with superficially located retained missiles. These cases always involve the probability of a skull fracture and a lesion of the brain.

The danger with brain abscesses is the perforation into the ventricle, a complication which formerly was always fatal.

CASE REPORT

A private, aged 27, was injured on Apr. 2, 1916, near Douaumont (France) and transferred to my hospital on Apr. 17. A nonpulsating fungus cerebri the size of a pigeon's egg was located in the left parietal region. Because of a high temperature the fungus cerebri was exposed and a superficial brain abscess containing a small shell fragment was opened. The bone defect was widened until pulsation of the brain set in again. No improvement, however, was reached. The patient succumbed after six days, following a rise of the pulse rate to 180, continued high temperature and increasing weakness. The autopsy revealed perforation of the peripherally developed abscess into the ventricle.

Nowadays the prognosis for brain abscesses has considerably improved due to the treatment with sulfonamides. O'Connell[42] succeeded in healing four cases of brain abscess developing after air raid injuries by chemotherapy. Miller[39] observed only two casualties among six cases of brain abscess. Treatment with sulfonamides made operation possible in several cases. Broster[8] had the definite impression that sulfonamides by mouth or intravenously delayed the necessity of operation and tended to localization of infection within the brain and that these abscesses can be excised *in toto* with their capsules at a later date.

Primary septic meningitis is a rare complication of fresh gunshot injuries of the brain, because the meninges in the surroundings of the wound get sealed very soon. It used to be a most dangerous complication fatal in almost all cases after operation of early brain abscesses.

Early traumatic epilepsy occurs soon after the injury, usually within the first week. No explanation can be given for the cause. Also primary closure of the wound will not prevent development of early epilepsy. Spells of unconsciousness and vertigo may be symptoms of early epilepsy. Operative treatment of early traumatic epilepsy has only to be considered if symptoms point to another condition (abscess, hemorrhage, foreign body).

Late complications. Among the late complications of gunshot injuries of the skull formerly operated on, the *bone defect,* sometimes of considerable size, has to be mentioned. Mostly the scar is adherent to the brain and shows distinct pulsation. Conditions of irritation as headaches, vertigo, buzzing in the ear and in a few cases traumatic epilepsy furnish the indication for operation. The

scar tissue has to be carefully removed and the bone defect closed by plastic procedure. If after excision of the scar tissue a defect of the brain is observed it has to be filled by free transplantation of fat tissue. Dura defects are repaired by transplantation of fascia lata or preferably by amnioplastin (Chao[12]). Bone defects are replaced by transplantation of a free bone flap covered with periosteum from the neighborhood of the defect. This plastic operation should not be performed too early. No symptoms of inflammatory brain irritation should have occurred within the last six months. But even when this precaution has been observed, a circumscribed brain abscess may develop around minimal bone or shell fragments. In this case a plastic operation has to be deferred. For this reason all cases of this kind should previously be submitted to a thorough x-ray examination, measuring of the intracranial pressure and careful examination of the cerebrospinal fluid.

An occasional late complication of gunshot injuries of the brain is *brain cyst*. It may arise from different causes. Isolated or multiple cyst following serous meningitis may have remained in the arachnoidal membrane. Absorbed hematomas or devitalized brain tissue replaced by serum may be responsible for the formation of a cyst. These cysts may grow and will cause the same symptoms as brain tumors. If these cysts arise in the frontal brain following an injury of a sinus, the liquid contents may partly or entirely be replaced by air (pneumatocele). Campbell, Howard and Weary[10] recently report a successful operation. The operation of these cysts following gunshot injuries is likewise subject to the danger of latent infection, especially if embedded bone or shell fragments are located in the cyst or its immediate surroundings.

Late brain abscesses. The danger of acute purulent inflammation, mostly fatal, continues to threaten the patient with brain injuries for months and years, even when the patient is in apparent health. Flaring up of latent infection causes late brain abscesses, subsequent perforation into the ventricle or diffuse meningitis. These late brain abscesses usually develop around small foreign bodies, grow extremely slowly, are of chronic type and diagnosed with difficulty. Sometimes they may be diagnosed by a good x-ray or by spinal puncture. The problem of decrease of formation of late brain abscesses by treatment of fresh injuries with sulfonamides will not be solved until years after this war.

Men injured by retained missiles are subject to the same dangers. If symptoms arise, the missile has to be removed. Otherwise chances of operation have to be balanced with chances of conservative treatment. Those injured by retained missiles should never be considered completely recovered and need continuous observation by trained specialists.

Jackson's epilepsy has likewise to be considered as a late complication of gunshot injuries of skull and brain. World War I contributed little to our knowledge of traumatic epilepsy. We only know that patients with broad scar formation after open treatment were more subject to epilepsy than those treated with primary closure. The interval between injury and the first convulsive seizure may extend over a period of years in cases of gunshot wounds. What causes irritation of the brain cortex and produces epilepsy has not been revealed by the experiences of World War I.

Ascroft[3] has used for study 317 cases of head injuries of World War I from the records of the Ministry of Pensions in England, which have been under ob-

servation for a period of seven to twenty years.

		Per cent
From epilepsy, suffered	107	(34)
succumbed	14	(4)
Succumbed from causes connected with the head injury	3	
Fits with cases of dura injury		45
Fits with cases of uninjured dura		23

The removal of the missile did not seem to reduce the liability to epilepsy. Retarded healing of the wound proved favorable for the development of epilepsy. Denny-Brown[23] on the other hand found only 53 cases of traumatic epilepsy among 630 fully documented consecutive patients, this being only 8.4 per cent compared to the 34 per cent of Ascroft. I believe the rate of Ascroft to be too high, that of Denny-Brown to be too low. The problem of the frequency of epilepsy after gunshot injuries of skull and brain has not been solved although twenty-five years have gone by since the end of World War I. Since in the present war early operation and primary closure of gunshot wounds of skull and brain will probably be the method of choice, it is to be expected that epilepsy will be less frequent due to improved healing of the wounds. On the other hand, the increase of subdural hematomas without penetrating wounds recently mentioned by several authors may result in the increase of Jackson's epilepsy, especially with cases not having been diagnosed and treated at any early stage. For this reason routine treatment with luminal seems to be justified as soon as possible with *all* cases of head injuries following injury or operation. Foster Kennedy[35] urges continuation of this treatment for at least one year because of the possibility of convulsions appearing within twelve or fifteen months.

The extreme importance of examination by trained specialists and immediate treatment of head injuries, as shown by experiences in World War I, has motivated the establishment of neurosurgical centers in this war. Specialized observation will be necessary over a period of many years. As the payment of pensions to patients with head injuries will be subject to reports from regular check-ups, such payments should be easily adjusted following examination.

SUMMARY

With the introduction of the steel helmet, skull and brain injuries decreased in number. An increase has been reported, however, in injuries by small and minimal shell fragments and in subdural hematomas, with and without lesion of the tabula interna.

Immediate transportation of all patients with head injuries to the nearest neurological center, with delayed operation thereafter, is recommended. Primary closure of the skull and brain injuries following débridement and treatment with sulfonamides is the treatment of choice. Sulfonamides administered orally or intravenously have lowered postoperative mortality and improved prognosis in cases of brain abscesses and fungus cerebri. Primary closure decreases the incidence of Jackson's epilepsy as a late complication.

Patients who have had skull or brain injuries should remain for a period of years under the regular observation by competent neurosurgeons.

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RÉSUMÉ

L'introduction de casque d'acier a diminué les traumatismes du crâne et du cerveau; on a observé, néanmoins, une augmentation d'hématomes sous-duraux avec ou sans lésion de la table interne. Ces lésions résultaient de petits fragments de projectiles. Il est recommandé de transporter immédiatement le blessé au plus proche centre neuro-chirurgical. La fermeture immédiate du crâne après débridement et traitement avec les sulfonamides est la méthode préferée. Les sulfonamides administrés oralement ou intraveneusement ont diminué la mortalité postopératoire et ont beaucoup amélioré le pronostic dans les cas cérébraux et de fungus cerebri. La fermeture du crâne diminue l'incidence de l'épilépsie jacksonnienne comme complication tardive.

Les blessés du crâne doivent rester pendant une période d'années sous l'observation de neuro-chirurgiens compétents.

SUMARIO

Con el uso del casquete de acero, el daño al craneo y cerebro han disminuído en número; pero un aumento as aparente en el daño causado por pequeños fragmentos, y hematomas subdurales, con o sin lesión de la "tabula interna."

Recomienda el transporte inmediato de los pacientes con daño de la cabeza al más próximo centro de neurocirugía así como también la demorada intervención quirúrgica.

La sutura del craneo después del débridement necesario y tratamiento con

las sulfonamides es el manejo de elección.

Las sulfanomides administradas por la vía digestiva o intravenosa han bajado la mortalidad y mejorado el prognóstico en casos de abseso y de fongus cerebri.

La sutura primaria en casos de daño al craneo cerebral disminuye la incidencia de la epilepsia de Jackson como complicación remota.

Los pacientes que han sufrido daño al craneo o al cerebro deberán ser observados sistematicamente por un período de años por competentes neurocirujanos.

Выводы

Количество повреждений черепа и мозга снизилось после введения стального шлема. Однако, сообщается о росте повреждений мелкими и мелчайшими осколками бомб, субдуральных гематом с сохранностью или с нарушением целости внутренней пластинки.

Всех пациентов с поражением головы рекомендуется немедленно транспортировать в ближайший нейрохирургический центр. Оперативное вмешательство откладывается на соответственный срок. Первичное закрытие повреждений черепа и мозга вслед за обработкой раны и лечение сульфонамидами является делом выбора. Суьфонамиды per os или интравенозно снижают послеоперационную смертность и улучшают прогноз в случаях с абсцессами и размягчением мозга.

Первичное закрытие раны снижает количество случаев Джексоновской эпилепсии, как позднего осложения.

Пациенты с повреждениями черепа и мозга должны оставаться годами под регулярным наблюдением опытного нейрохирурга.

NINTH ANNUAL ASSEMBLY
UNITED STATES CHAPTER

The Medical Profession
is invited to attend the Ninth Annual
Assembly of the United States Chapter
of the
International College of Surgeons
to be held in Philadelphia, Pa.
October 3-5, 1944
Benjamin Franklin Hotel

Testicular Hormones and Their Influence on Prostatic Hypertrophy

N. KOOK, M.D.*

JERUSALEM, PALESTINE

IN few fields of surgery is the material so unilateral as in hypertrophy of the prostate. Those affected by this condition are only men and of advanced age.

Sex and age are two important factors to be considered when anticipating operative results. Regarding sex, it is a well-known fact that women are much more resistant to hemorrhage than men, and are less liable to postoperative complications; should any complication set in, this assumes a much milder form than in men. Regarding age, it is known that in patients from the age of 45 and up the postoperative death rate increases greatly.

Considering these factors, it is no wonder that the mortality rate following prostatectomy is high. Although official statistics give a mortality rate of 6-8 per cent in prostatectomy, the actual percentage is much higher if we consider all fatal cases which are both direct and indirect consequences of the operation. The latter should be included because from the patient's point of view it is of little importance whether death resulted directly or indirectly from the operation.

ENDOSCOPIC RESECTION

Endoscopic resection has reduced the mortality rate from prostatectomy. (According to Negly the ratio is 1 to 3.) However, it must be pointed out that endoscopic resection requires many victims before the surgeon has mastered the operation *lege artis*. Besides, this procedure is not possible in all cases, not to mention the problem of recidives, a solution to which has not yet been found. Now that the first enthusiasm over endoscopic resection has subsided, it is known that the mortality rate in this procedure is not as small as was first thought. (This rate fluctuates between 2 and 4 per cent according to Bumpos and MacCarthy, reaches even 10 per cent according to Randol.) No wonder, then, that new methods of treatment are being sought.

The fact that prostatic hypertrophy is associated with old age long ago gave rise to a belief in its relation to the sex organs. This condition has even been regarded as the climacteric of the male. The first to perform large-scale experiments based on this hypothesis was White. As early as 1893 he reported results in 111 cases of hypertrophy of the prostate treated by castration, in 87 per cent of which good results were obtained. This method of treatment has received little attention because not all patients are willing to undergo similar treatment and because further experimental work did not confirm the results reported by White.

*From the Surgical Department, Hadassah University Hospital.

LIGATION OF VAS DEFERENS

The ligation of the vas deferens brings much closer the possible relation between hypertrophy of the prostate and the sex organs. The ligation of the vas deferens is considered very useful in cases where a continuous catheterization is instituted only to avoid an epididymitis, and is thought to have no influence on the prostate. We think this conclusion to be erroneous. Unfortunately, the few papers on the treatment of hypertrophy of the prostate by this method report only a very small number of cases. In 1932 we reported on 33 cases of hypertrophy of the prostate treated by the ligation of the vas deferens, and with good results (some of the patients also received roentgen ray and diathermic treatment). At the time we concluded that "since this condition develops only in advanced age, and by ligature, according to Steinach, we 'rejuvenate' the patient, it should disappear or at least not progress."

Unfortunately, we abandoned this method of treatment in view of the good results claimed for endoscopic resection. Even today we meet patients treated years earlier by ligation of the vas deferens who still have no prostatic complaints. It is clear that difficult cases cannot be treated by this means; furthermore, care must be taken not to cause any lesions of the nerves and blood vessels of the cord which would result in atrophy of the testis.

HORMONE THERAPY

Recent developments in endocrinology have shown the close relationship between the prostate gland and sex hormones. In 1849 Berthold discovered an internal secretion of the testis, but it was only in 1927 that MacGee succeeded in isolating a hormone from the testis. Butenant in 1931 succeeded in crystallizing from male urine a hormone called androsteron. In 1935 Laqueur and others found a second hormone which they called testosterone; this was found to be five to seven times more active than androsteron. Zondek, Evans and others have found gonadotropic hormone in the hypophysis; this hormone was discovered to bear some relation to the prostate. Zondek has succeeded in causing hypertrophy of the prostate through injections of pregnancy urine. Engle has, on the other hand, caused atrophy of the prostate by hypophysectomy.

Two theories have been put forward to account for the influence of sex hormones on hypertrophy of the prostate. According to the first, the testes contain a hormone having a depressive influence upon the hypophysis. With advance in age, the production of this hormone decreases or disappears altogether, and hyperfunction of the pituitary thus follows. This hyperfunction is responsible for hypertrophy of the prostate (McCullagh, Lower and others).

According to a second theory, the testes produce male and female hormones. These are in a certain equilibrium. Advanced age brings with it a disturbance in this equilibrium, and it is the preponderance of the female hormone which causes hypertrophy of the prostate (Zuckerman, Rusch and others). Whichever theory is the correct one, according to both of them hypertrophy of the prostate is not so much a surgical disease as a manifestation of a hormonal disorder. From this it follows that the primary treatment should be of hormonal nature — a treatment of compensation.

As soon as these above-mentioned papers appeared in the medical literature, many physicians, not necessarily urologists, began treating hypertrophy of the prostate with sex hormones. As might have been expected, disappoint-

ments soon followed. The reasons for these failures are obvious.

First, treatment with hormones gives good results only in those cases where no considerable anatomic changes have already taken place. In cases with complete retention or great urine residue, hormone treatment is unable to reduce the size of the prostate to an extent that will permit normal urination. In other words, the hormones have a symptomatic rather than anatomic effect. Disturbances in urination do not always correspond to the degree of prostatic hypertrophy.

Second, the dose is often incorrect. It would be reasonable to assume that the greater the dosage, the better the results. In many cases, however, large doses produce opposite effects. In the literature no definite dosage is given. It seems that when larger doses are used, the amount of hormone excreted is greater. (Little is yet known as to the excretion of hormones in a man affected with prostatic hypertrophy and in a man clinically healthy.)

Third, in many instances hormones were used in cases with no prostatic hypertrophy. Not all disturbances of urination are caused by hypertrophy of the prostate (stones, diverticulum, etc.).

Fourth, the quality of various products differs. Not all hormones on the market have proved to be effective.

AUTHOR'S RESULTS

We have administered hormonal treatment to 86 patients with hypertrophy of the prostate. According to age, they were distributed as follows:

Age	*No. of Cases*	*Per Cent*
Under 60	16	18.6
60-70	24	27.9
70-80	32	37.2
Over 80	14	16.3
	86	100.0

In every case urine and blood examinations were performed, cystoscopy, residual urine and, in the majority of cases, renal function tests. As a matter of principle, we did not give hormone treatment in cases where the urine residue was higher than 100 cc. (except in those cases where operative intervention was contraindicated; we had 8 such cases, not included in this series). Even in those cases where a patient with high retention objected to operative treatment, no hormone treatment was given. It can therefore be seen that only selected cases are reported here.

In 28 cases the medial lobe was enlarged, in 14 the lateral lobes and in 44 all lobes. Urine retention was:

Amount	*No. of Cases*	*Per Cent*
50-100 cc.	50	58.2
0- 50 cc.	32	37.2
Hypertrophy with dysuria	4	4.6
	86	100.0

In most cases we employed Neo-Hombriol (testosterone propionate). The following scheme of treatment was used:

Ten mg. Neo-Hombriol were given for four consecutive days. In cases where no improvement followed after three or four injections, this treatment was considered as not suitable and was interrupted. In those cases where nocturia and clinical symptoms showed no improvement, a further course of four injections of 10 mg. Neo-Hombriol daily was given. In these cases as well as in those in which symptomatic improvement was reported, besides a definite decrease in urine retention, another four injections of 10 mg. Neo-Hombriol were given every other day. In all cases two injections of Neo-Hombriol were given every week for three to six weeks.

On termination of this course of treatment, a cystoscopy was performed in every case. It should be noted that even in cases with definite clinical improve-

ment we were unable to find a marked decrease in size of the prostate. It is well known that the urinary disturbances do not always correspond to the grade of hypertrophy of the prostate. We often see huge prostates that cause no trouble and sometimes slightly enlarged prostates causing complete retention. According to Frank, 50 per cent of those affected with hypertrophy of the prostate do not complain of any disturbances. It seems probable that the hormones have an influence on the tonus of the bladder. This would eliminate a small urinary retention, with consequent improvement of the prostatitis.

It is worthy of note that in the majority of cases, besides the improvement in urination, the patients remarked on a noticeable general well-being. This was so characteristic that in several cases of senile marasmus—with no relation to the prostate—we gave Neo-Hombriol as a stimulant, with good results. There are no contraindications to this treatment, although caution must be exercised in cases with high blood pressure.

The following results were obtained by means of our hormonal treatment with Neo-Hombriol:

Sixty-nine cases were completely cured. Twelve patients returned during the following three years. In 10 of these further hormone treatment ameliorated the condition; in the other 2, notwithstanding an improvement, endoscopic resection had to be performed because of urinary retention.

Six patients died during treatment from causes *not* connected with the prostatic hypertrophy.

Seven cases showed improvement, but because of urinary retention and normal-functioning kidneys, operation was recommended.

Four cases showed no improvement.

The opinion that the influence of sex hormones on hypertrophy of the prostate is similar to that of insulin in diabetes (*i.e.*, necessitating continuous administration) was not confirmed in our material. In the great majority of cases we had complete clinical recovery lasting for months or even years.

RÉSUMÉ

Après avoir considéré la résection endoscopique et la ligature du vas deferens dans l'hypertrophie prostatique, l'auteur discute le traitement avec les hormones sexuelles.

Il n'y a pas de doute que de bons résultats peuvent être obtenus avec le traitement hormonale de l'hypertrophie prostatique. Les hormones sexuelles ont spéciale importance dans les cas avec de manifestations dysurique et aussi pour éviter de reliquats après une résection endoscopique. La choix des cas et la qualité des préparations employées ont une grande influence sur les résultats du traitement.

Les résultats du traitement dans 86 cas sont rapportés par l'auteur. Parmi ceux-ci 69 guerirent complètement.

SUMARIO

Después de considerar la resección por endoscopía y la ligadura del conducto deferente en la hipertrofia prostática, el autor discute el tratamiento por medio de las hormonas sexuales.

No hay duda acerca de los buenos resultados que se pueden obtener con las hormonas en el tratamiento de la hipertrofia de la próstata. Las hormonas sexuales son de especial importancia en los casos con manifestaciones de disuria, también para evitar los residuos glandulares después de la resección por endoscopía. La selección de los casos y la calidad de los productos que se usan tienen una gran influencia en los resultados del tratamiento.

El autor da a conocer los resultados obtenidos en 86 casos tratados, de los cuales 69 se curaron completamente.

Выводы

Осветив вопрос об эндоскопической резекции и перевязке отводящих сосудов при гипертрофии простаты, автор дает оценку современному лечению половыми гормонами.

Без сомнения, при гормональном лечении гипертрофии простаты могут быть получены хорошие результаты. Половые гормоны дают положительные результаты в случаях с дизурическими явлениями. Они так ше дают возможность избежать резидуальных явлений после эндоскопической резекции.

Подбор случаев и качество подготовки, обычно, оказывают большое влияние на результаты лечения.

Автором приводится результат лечения 86 случаев. В 69 случаях наступило полное излечение.

Dr. William Henry Welch (1850-1934)

ON THE OCCASION OF THE TENTH ANNIVERSARY OF HIS DEATH ON APRIL 30, 1934

SOLOMON R. KAGAN, M.D.

WILLIAM H. WELCH, the Dean of American Medicine, was great in several branches of medicine. He was a genius in the field of pathology and bacteriology, a leader in public health and social welfare, an inspiring teacher and an outstanding medical organizer. He introduced the newer pathology and the newer bacteriology; he was also a founder of the Johns Hopkins Medical School and Hospital, School of Hygiene and Public Health, Institute of the History of Medicine and the Welch Memorial Library in Baltimore. He was the greatest medical educator of his time.

Several letters written by Welch which reflect the personality of this great physician and man and have an historical interest are herein reproduced.

From W. H. Welch to F. H. Garrison.

WAR DEPARTMENT
OFFICE OF THE SURGEON GENERAL
WASHINGTON

November 20, 1918.

Dear Garrison,

Thank you for your biographical sketch of Frank Baker. It is charming—you have a wonderful knack of discriminating personal characterization, and Baker had delightful personal traits. I admired and liked him greatly. We have had few more enjoyable and instinctive papers at our J. H. H. Historical Club than his papers on the two . . . and Vesalius and anatomical illustration.

I have an interesting letter from Osler which I should like to show you, if you can drop in to my room some day—

Very sincerely yours,
William H. Welch.

Baltimore, Maryland, March 10, 1920.

Dear Garrison,

I have received to-day from the Adjutant General a certificate in French which reads as follows . . . I wonder if you can give me any information what this order is, and whether any insignia go with it.

I presume that it may be some new military order widely distributed to Americans, but I have never heard of it before.

I shall be very much obliged for any information—

Very sincerely yours,
William H. Welch.

[1920?]

Dear Garrison,

. . . The form of inscription, which I showed you in Washington, read as follows and was a revision of one sent me by J. Collins Warren:

William Thomas Green Morton
Born August 9, 1819
Died July 15, 1868

Before him in all time
Surgery was Agony

By his use of ether in a capital operation at the Massachusetts General Hospital on October 16, 1846 anaesthetic inhalation became known to the world as a safe, certain and complete means to annul pain and a new era in surgery began.

A discovery which enables man to undergo, without the sense of pain, the severest physical trials to which human nature is subject,

Morton.

(Continued on page 159)

Sarcomatous Degeneration of Fibroma

I. TRACTENBERG, A.B., M.D., F.I.C.S. AND WM. OLIVER, A.B., M.D.*
BROOKLYN, NEW YORK

THERE seems to be a definite disagreement between authorities as to whether malignant degeneration of fibromyoma is rare. Some state that it is; whereas others claim it is not.

From a series of cases collected from literature, we may say that such degeneration varies from 1.8 to 4.3 per cent.

In our own series of 153 operations for fibromyomata uteri, two cases of sarcomatous degeneration were found, which gives a percentage of 1.3.

Why this variation exists may well be explained by the experience of Winter.[7] In a first series of 500 cases of fibromyoma, suspicious areas only being examined, sarcomatous degeneration was found in 3.2 per cent; whereas, in a subsequent series of 253, all parts of the tumor being examined microscopically, the incidence was raised to 4.3 per cent.

We agree with other authorities that the submucous type is more apt to undergo malignant degeneration more frequently.

In myomas which were not macroscopically suspicious, Kaufman has repeatedly seen isolated areas of malignant degeneration. Sometimes the center of an older fibromyoma presented such degeneration. For this reason, he considered these changes not unusual. That such change is actually the result of degeneration in an older, originally pure fibromyoma is recognizable by the considerable change in the shape of the uterus, the distortion of its cavity and the hypertrophy of its walls as found in any simple, intramural myoma of marked size and long duration.

Histologic differentiation between sarcomas and rapidly growing myomas or those with very cellular areas is not always simple. Ewing has pointed out that ordinary myomas vary in structure in different portions and probably at different periods. These suspicious areas, however, are not always progressive. They may signify a temporary or local acceleration of growth which may either subside or regress. Nor is it justifiable to consider these areas as evidence of sarcomatous transformation, *for which much more extensively altered areas or even general metastases might well be demanded.*

DIFFERENTIAL DIAGNOSIS

Some such general criterion justifying the use of either the descriptive phrase, to wit, sarcoma in fibromyoma of the uterus or sarcomatous degeneration of fibromyoma should be established. At this point it is not our intention to discuss the conflict in basic theories that has arisen over the past few years as to whether the sarcomatous character of such new growths is the result of metaplasia from already highly differentiated muscle cells or from immature myo-

*From the Department of Gynecology, Unity Hospital, Brooklyn, N. Y.

blastic, fibroblastic or angioblastic *rests* within the myometrium or the fibromyoma. Merely finding a small area of "sarcoma" in one nodule of a uterus containing a number of otherwise "pure" fibromyomata should not justify the classification of the case as one of sarcoma. Such isolated areas, as Kaufman has noted, are not unusual changes in otherwise innocent looking fibromyomata.

Furthermore, the thoroughness with which pathologists section specimens removed at operation is variable. Likewise, the number of staining solutions employed is a matter of variable routing.

Several examples come to mind. The literature contains few reported cases of rhabdomyosarcoma. Because of its rarity, the average pathologist may not even think of this type as a possible diagnosis. Unless routine staining of uterine tumors be done with Mallory's phosphotungstic acid hematoxylin and Heidenham's iron hematoxylin, the characteristic cross-striations of rhabdomyoma might be missed.

In an excellent review by Goldberger[6] of sarcoma in fibromyoma, two cases are described in detail. The first was that of a young woman of 28 upon whom a myomectomy and a left salpingo-oöphorectomy were done for what was pathologically reported to be a "myosarcoma" and dermoid cyst of the left ovary. Further radical treatment was refused until about nine years later when she returned to the clinic complaining of a return of her irregular, prolonged menstrual periods for four months.

A complete hysterectomy and right salpingo-oöphorectomy were done. The pathologic diagnosis was multiple fibromyomata and adenomyosis uteri with normal adnexae.

The second case was that of a white woman of 37 with a uterus enlarged to the size of a ten week's pregnancy, irregularly enlarged by multiple nodules varying in size from a pigeon's egg to a hen's egg. The uterus was freely movable and not tender. At operation, multiple intramural fibromyomata in the anterior wall of the uterus were removed by shelling them out from the distinct capsules. The pathologic diagnosis was "myosarcoma."

Further radical treatment was refused. Five years later, though having no subjective complaints, her uterus having increased in size during the preceding three months, she submitted to a panhysterectomy. The pathologic diagnosis was multiple fibromyomas and adenomyosis with no evidence of sarcoma. In a personal communication to one of us Goldberger advised that "sarcoma" (the quotes are ours) was found in only one of the fibromyomata removed at the initial operation. No detailed description of the "sarcoma" was obtained in the original paper or in his personal communication. Thus, it is difficult to ascertain therefrom whether the pathologist found a "pure" sarcoma or an isolated area or several areas of "sarcomatous degeneration" in the single fibromyomatous nodule removed at the initial operation.

In both of these cases, one nine years and the other five years after the diagnosis of sarcoma was originally made, secondary laparotomy failed to reveal any further evidence of sarcoma. The literature contains many cases reported in such manner. The effect upon accurate statistics seems self-evident and leads us once more to urge that it is not justifiable to consider isolated suspicious areas as evidence of sarcomatous transformation.

A special difficulty arises from the fact that young, fast-growing, cellular myomas of medullary, white, or greyish-white appearance consist of both short,

oval and spindle-shaped cells. The deciding factor is the uniformity in shape and size of the cells and their nuclei in contradistinction to the marked polymorphism of cells and nuclei in spindle celled sarcomas, and those myomas undergoing sarcomatous degeneration. In cellular myomas abundant hyaline connective tissue is often seen. During pregnancy the cells of a myoma, if the latter enlarges, may become as large as those of the pregnant uterus. In differentiating between a quickly growing myoma, the common "pure" spindle cell sarcoma and sarcomatous degeneration of a fibromyoma, it must be recalled that the cells of the latter are smaller and poorer in protoplasm. Up to 1928, Ewing[1] had encountered but three malignant uterine myomas with general metastases and two with local recurrence in 20 years. He concluded that "malignant degeneration of myoma must be rare." Malignant myomas produce metastases by way of the blood channels and possibly through the lymph channels. According to their growth they are, therefore, *biologically* malignant. *Histologically* they are typical myomas distinguished from sarcomatous myoma (or sarcomatous degeneration of myoma) in that their muscle cells are more highly developed (as previously stated) and are more highly uniform.

When myomatous tissue continues to grow, it gives rise, according to Kaufman,[2] not to "normal" smooth muscle cells but to sarcoma cells. The spindle shape of these newly formed sarcoma cells deviates more and more from the shape of muscle cells. Their nuclei become shorter and thicker, ovoid, polymorphous, and sometimes giant nuclei are seen. Frequently, these are hyperchromatic and show direct and indirect nuclear divisions. The cells are crowded closely with practically no interstitial substance and are short and plump. Eventually, the sarcoma cells lose all similarity to muscle cells. Since sarcoma cells are thus the "lawless" outgrowth of muscle cells, the process is not metaplasia but degeneration. Other terms occasionally employed to describe sarcomatous degeneration of a fibromyoma are "sarcomatous myoma," "myosarcoma" and, rarely, "myomatoid sarcoma." The first two terms have a reasonable pathologic basis. "Myomatoid sarcoma," on the other hand, is incorrect, inasmuch as it infers that the tumor is a sarcoma which either is or tends to become a myoma.

FORMS OF SARCOMATOUS DEGENERATION

Of the two forms of sarcomatous degeneration, that one arising from the myomatous components of a fibromyoma or from a "pure" myoma is more frequent than that arising from the fibrous component. A sarcoma arising from the fibrous component may properly be termed a myosarcoma or even a fibromyosarcoma. Generally, these are spindle or round cell tumors or myosarcomas.

It follows that the most frequent site should be the uterine wall. Goldberger states that 7 per cent are submucous and about 1.6 per cent subserous. He further states that about 1.3 per cent of all uterine tumors are sarcomatous, with corpus sarcoma being about eight times as common as cervical, and carcinoma about twenty-eight times as frequent as sarcoma.

Sarcoma usually is encountered in women in the age of the menopause, although it may be present at any age. Simon[8] reported a case of multiple fibromyomata of the uterus in a 50-year-old colored female of apparently 18 years duration in which associated leiomyomyxosarcoma of the uterus with peritoneal sarcomatosis were associated. Barnes[9] in reporting two cases of simul-

taneous occurrence of primary sarcoma and carcinoma of the uterus, states that only twenty-eight cases of such distinct, simultaneously occurring, primary malignant tumors of the uterus have been reported in the world's literature up to 1941. While a fibroid nodule was found in the wall of the uterus in one of his two cases, in neither was there definite evidence of the sarcoma having arisen on the basis of malignant degeneration of the fibroid. In each case biopsy led to the diagnosis of sarcoma. The carcinoma was found only after laparotomy. In both cases the tumors were definitely separated from each other.

BIOPSY BY CURETTAGE

At this point, some mention concerning the value of biopsy by curettage is in order. The polypoid shape of the usual endometrial sarcoma may elude the curet, whereas the average adenocarcinoma involving the endometrium rarely escapes. Then, too, the more malignant types of adenocarcinoma may present a gross polypoid appearance similar to the majority of endometrial sarcomas. Such cases of "sarcoma appearing in fibromyoma" have almost uniformly been reported in the literature as such only after laparotomy for fibromyoma and subsequent pathologic examination. Hence, the diagnostic curet offers little assistance in diagnosis of malignant sarcomatous degeneration of an apparently benign fibromyoma.

Occasionally, a thick soft sarcomatous polyp, attached to the main fibromyoma in the corpus of the uterus, may hang down into the dilated cavity as far as the cervix. If the uterus itself is not enlarged too much and its contour none too irregular or the patient's abdominal wall somewhat obese, making delineation of the uterus rather difficult, the finding of such a protruding polyp may lead one to infer that he is dealing with a bleeding cervical polyp of the average benign variety. To twist off and cauterize the base (?) of such a polyp in the office, and dispose of the specimen in the waste can, instead of sending it to the pathologist, as is so often the case in the average handling of cervical polyps, may have dire consequences for the patient.

Indeed, there are no characteristic symptoms. Goldberger mentions, as suggestive symptoms, a rapid growth of a myoma with a feeling of pelvic distention and painful uterine contractions, especially if these symptoms occur at the menopause or after x-ray therapy for fibroids. If there were symptoms significant of sarcomatous degeneration of a fibromyoma, it seems hardly likely that 72 cases reported by Evans[10] of sarcoma of the uterus in 4000 cases of fibromyoma at the Mayo Clinic would have all been incorrectly diagnosed preoperatively as simple fibromyoma.

PERCENTAGE OF CURES

Evans[10] reported 100 per cent and Steinhardt (quoted by Goldberger) 80 per cent five-year or more cures if operated on early. It is difficult to evaluate these statistics since the question of finding areas of "sarcomatous degeneration" (as previously discussed when giving the opinions of Ewing and Kaufman) comes into play. Since, however, there is always the possibility of extension it would appear wisest to perform a panhysterectomy including the adnexae, if the sarcomatous element appears, *grossly,* to invade the uterine wall. Confronted, however, with a young woman in the child-bearing age and desirous of having at least one child, a pathologic report of "sarcomatous degeneration" in one of the fibromyomas enucleated during the course of a conservative operation should not, we believe with Goldberger, lead to the recommendation of an immediate

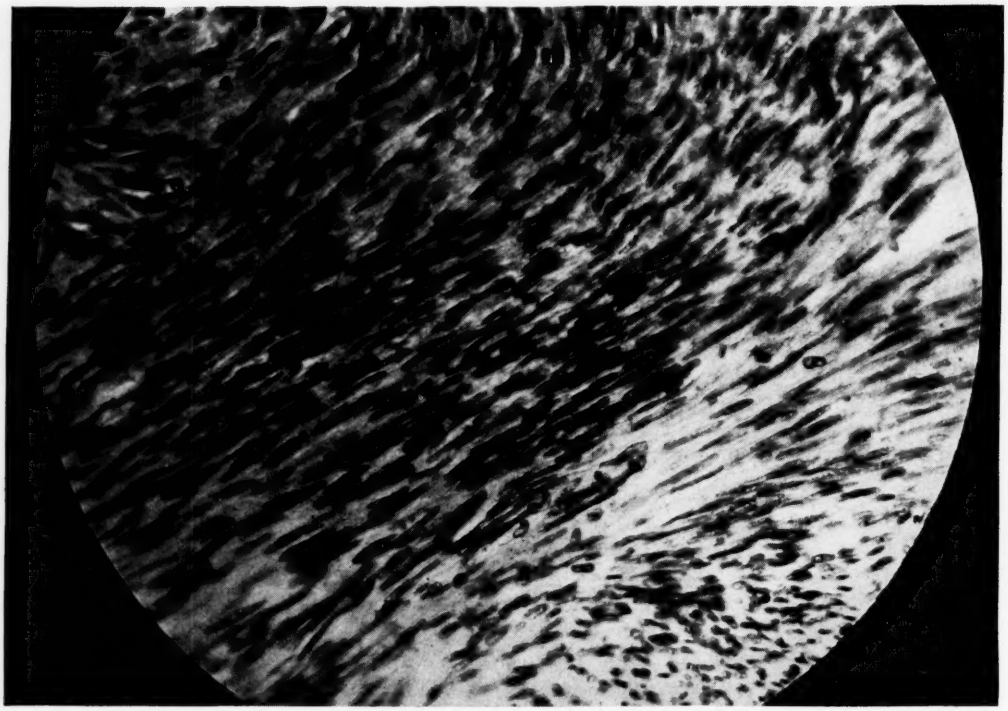

Fig. 1. *Case 1.* Section of uterus showing thickened fibrotic uterine wall with intramural nodules under high-power magnification.

further operation of a complete panhysterectomy including the removal of the adnexae.

X-RAY THERAPY

There seems to be some conflict as to whether x-ray therapy is of value. Kaufman, quoting Seitz and Wintz, states that "sarcomas react to the x-rays quite differently from fibromyomas. While the latter regress very slowly, possibly because of cessation of ovarian activity, sarcomas are quickly and directly affected and disappear in a few weeks. Partially sarcomatous fibromyomatas shrink more slowly." Smith[11] on the other hand, reporting on cases treated at the Memorial Hospital in New York City, concludes that "it must be assumed that sarcoma of the uterus is not sensitive to radium or to x-rays in a comparative sense. Possibly with further development or with variation of the several therapy factors, such as use of the million-volt machine, a more optimistic estimation may replace the present pessimism as to the futility of irradiation therapy for sarcoma of the uterus."

It is our impression that Smith is referring to that type of sarcoma which invades either wall or the endometrium of the uterus and not, as we have already repeatedly pointed out to those "areas of degeneration" of "sarcoma" found at the center of fibromyomas appearing grossly benign at the operating table and reported to be "sarcoma" only after careful microscopic examination.

Reports of two of our cases treated surgically follow.

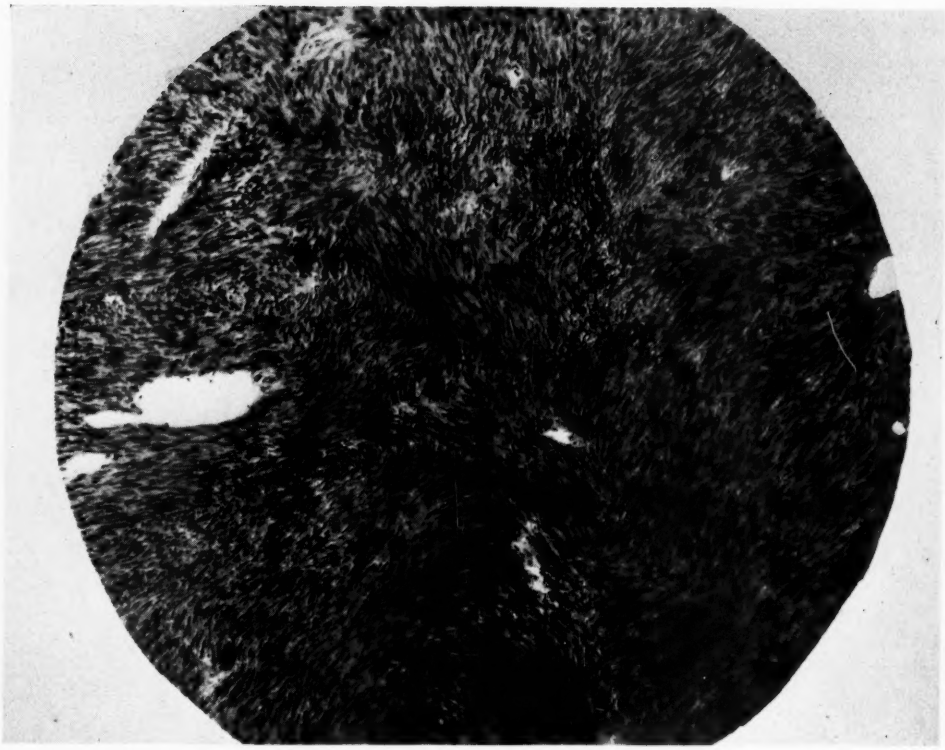

Fig. 2. Low-power magnification of same section.

CASE REPORT

Case 1. White female, aged 56, was admitted to the hospital on Nov. 10, 1936. The patient's history revealed that in the early part of Feb., 1936, she had a D and C done in order to stop irregular uterine bleeding. At that time a diagnosis of fibroid uterus was made.

Bleeding stopped within the next three days and she remained well up to Oct., 1936, when she was suddenly seized with severe cramps in the lower abdomen, and vaginal bleeding started again. Examination revealed some tenderness and slight rigidity in the lower abdomen. Pressure-released tenderness was not present in the lower abdomen. Vaginal examination revealed the cervix in the normal axis rather hard and closed. The uterus was moderately movable, enlarged to the size of a three-month pregnancy. There was a mass present on the fundus.

Urine examination was negative, white blood count was 16,300, polymorphonuclears 84 per cent, lymphocytes 12 per cent, monocytes 4 per cent, hemoglobin 73 per cent, and the red blood cell count was 3,600,000.

A preoperative diagnosis of degenerated fibroid of the uterus was made. A laparotomy was performed under spinal anesthesia. There were several small subserous fibroids at the fundus. Both tubes and ovaries showed evidence of a chronic inflammation. A total hysterectomy and bilateral salpingo-oöphorectomy was performed.

The patient made an uneventful recovery and was discharged eighteen days after the operation.

The removed uterus was about the size of a large grapefruit, of irregular shape, with a small enlargement of the left side of the fundus. Section made through the entire uterus showed a thickened fibrotic uterine wall with intramural nodules.

One nodule protruded into the thickened

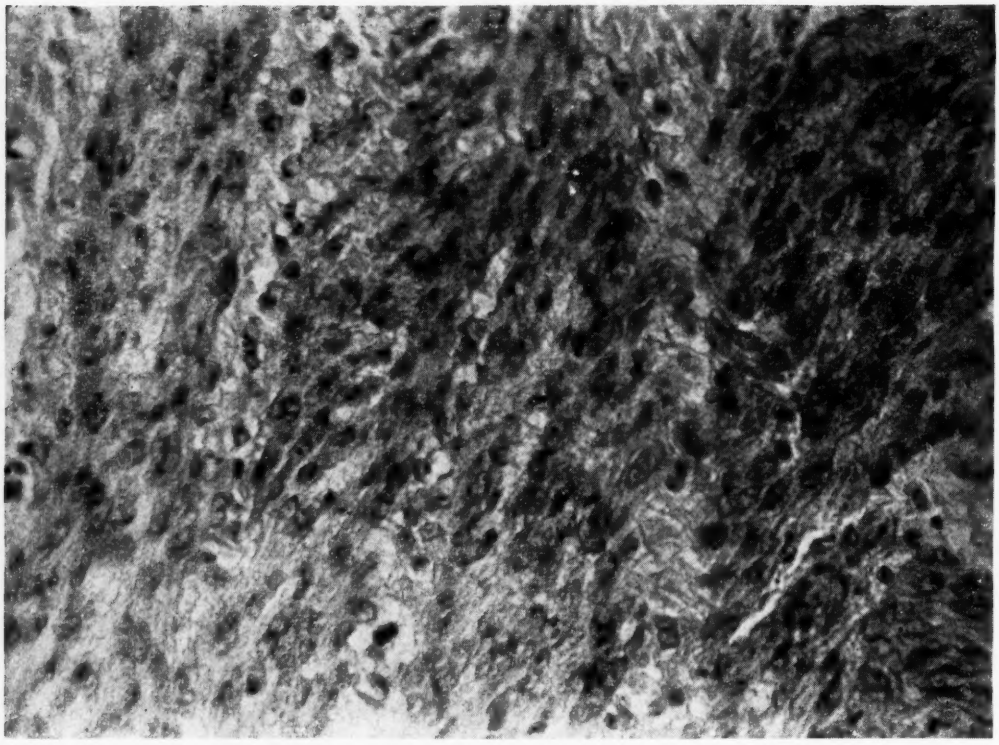

Fig. 3. *Case 2.* Section of the globular intramural uterine tumor, which was in the main soft and edematous, containing many irregular cystic cavities. Macroscopically it was deep yellow in color, revealing extensive degeneration.

and congested uterine cavity. The surface of the nodule was irregular in shape, the tissue was soft, mushy and red in appearance and was covered with a bloody material. At one portion, it was grayish white in color.

Microscopic examination showed that the tumor tissue consisted of irregular polymorphonuclear cells, most of which were spindle shaped. The nuclei were of unequal size and shape. Some of them were hypochromatic and mitotic figures were present.

Pathologic diagnosis: Spindle shaped sarcoma.

Case 2. A white, unmarried female, 47 years old, was admitted to the hospital on May 12, 1936. Her history revealed that for the past sixteen months her menstrual period, which ordinarily lasted four days became prolonged to ten and twelve days. She also had intramenstrual bleeding at four occasions and fullness and dull pain in the lower abdomen.

Upon examination, a large mass was palpable in the lower abdomen reaching up to the umbilicus. No point of tenderness was palpable. Upon vaginal examination, the cervix was soft and pointing anteriorly. The uterus was enlarged to the size of a five and a half month pregnancy and was freely movable. A diagnosis of fibroid uterus was made.

A laparotomy was performed and a large fibroid uterus was found. Both ovaries were cystic and enlarged. A panhysterectomy and a bilateral salpingo-oöphorectomy was performed under spinal anesthesia.

The patient made an uneventful recovery and was discharged fifteen days after operation.

The specimen removed was an enlarged uterus the size of a small melon. It was

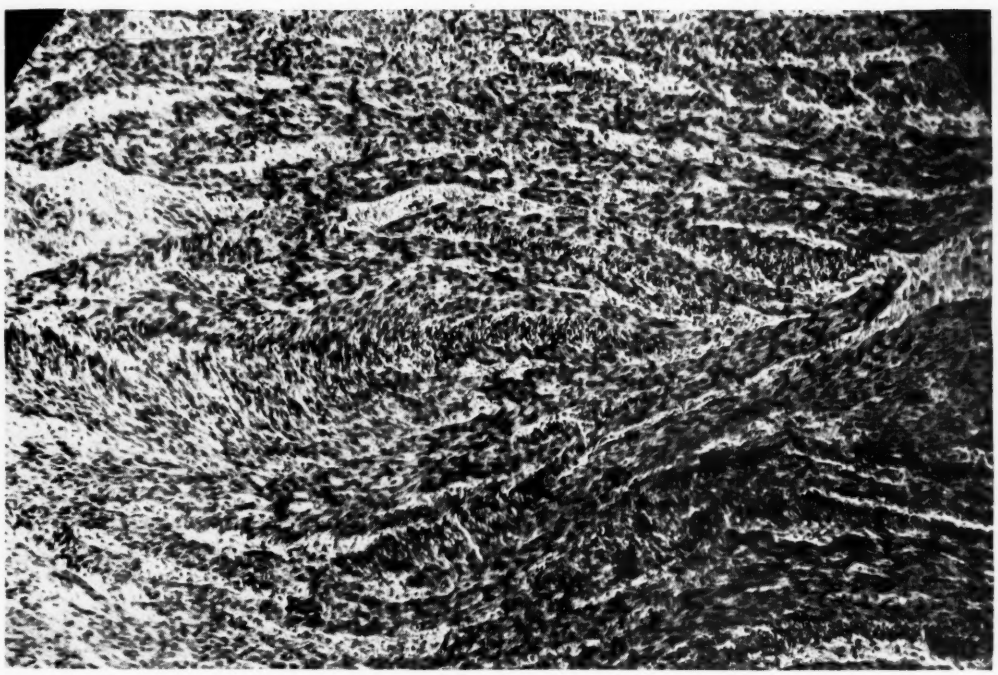

Fig. 4. Same section as preceding viewed under low-power magnification.

globular, somewhat irregular in shape. Upon cutting the specimen in half, a single globular intramural tumor was found. The main portion of the tumor was very soft, edematous, contained many small, irregular cystic cavities. The color was deep yellow, showing extensive degeneration.

Histologic examination revealed a tumor similar in architecture to an ordinary fibromyoma, yet of enormous cellularity. The nuclei of these cells were densely packed, their size and shape very irregular. Their chromantine content was increased. Mytosis were present.

Pathologic diagnosis: Sarcomatous degeneration of fibromyoma.

The treatment in both cases consisted of a panhysterectomy with wide excision and simultaneous removal of both appendages. This was followed by deep x-ray therapy.

Both patients, operated on more than five years ago, are alive and well.

We believe surgery is the main and the only method of treatment. It is tremendously important to open up every uterus and examine the endometrium and all myomas as soon as removed. If suspicious areas are seen, they should be examined immediately by frozen section. If a diagnosis of sarcoma is made, tubes and ovaries can then be removed immediately without delay.

SUMMARY

1. If all parts of the tumor are examined, the incidence of sarcomatous degeneration will be greater than if only suspicious areas are examined.

2. Ordinary myomas vary in structure in different portions and probably in different periods, these suspicious areas are not always progressive and there may be a temporary local acceleration of growth which may either subside or regress.

3. From accurate statistics it seems self-evident that one is not justified in considering isolated suspicious areas as evidence of sarcomatous degeneration.

4. Great care should be taken in differentiating between a fibrosarcoma and adenomyosis.

5. Or merely finding a small area of "sarcoma" in one nodule of a uterus containing a number of otherwise "pure" fibromyomata should not justify the classification as one of sarcoma.

6. The diagnostic curet offers little assistance in diagnosis of malignant sarcomatous degeneration of an apparently benign fibroma. Any cervical polyp should be carefully examined by a competent pathologist as to its nature.

7. If in a woman past the childbearing period, who is undergoing operation for fibromyoma, a grossly suspicious area is seen, we believe a panhysterectomy including the adnexae should be performed.

8. In a young woman of childbearing age, and desirous of having at least one child, a pathologic report of sarcomatous degeneration in one of the fibromyomas enucleated during the course of a conservative operation should not lead to the recommendation of an immediate, complete panhysterectomy including the removal of the adnexae.

9. Sarcoma of the uterus is not sensitive to radium or to x-ray in a comparative sense. Possibly with further development or with variation of the several therapy factors, a more optimistic estimation may replace the present pessimism as to the utility of irradiation therapy for sarcoma of the uterus.

Deep x-ray therapy should follow operation in all cases.

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SUMARIO

En una serie de 153 operaciones para las fibromiomatas uteri, el autor encontró con dos casos de degeneración sarcomatosa, esto es un incidencia de 1.3 por ciento. Estos dos casos son aquí discutidos con especial referencia al diagnóstico diferencial y el tratamiento de la degeneración sarcomatosa, con las conclusiones siguientes:

(1) Examen de todas partes del tumor y no solamente de porciones sospechosas, dará al reconocimiento de mayor incidencia de degeneración sarcomatosa.

(2) Miomas comunes varian en su estructura, con signos de aceleración local.

(3) Areas sospechadas, no deben ser consideradas como prueba de degeneración sarcomatosa.

(4) Gran cuidado es necesario en diferenciar fibrosarcoma y adenomiosis.

(5) Pequeña area de sarcoma entre "pura" fibromata no justifica la clasificación de sarcoma.

(6) Un raspado diagnóstico tiene poca utilidad.

(7) La panhisterectomía se recomienda para fibromioma con areas sospechosas en mujeres que han pasado el período de generación.

(8) En mujeras aún en condición de concebir, en casos de fibromioma, la histerectomía completa, incluyendo las anexas, no deben hacerse.

*The authors gratefully acknowledge the valuable assistance of Dr. Morris Weintraub in compiling a great part of the bibliography.

(9) Sarcoma del utero no es radiosensitiva. Los rayos-x, con penetración profunda, deben emplearse después de operación en todos los casos de degeneración sarcomatosa de fibroma.

RÉSUMÉ

Dans une série de 153 opérations pour fibromyomes utérins les auteurs ne rencontrent que deux cas de dégénéréscence sarcomateuse, une incidence de 1.3 pour cent. Ces deux cas sont analysés et le diagnostic différentiel ainsi que le traitement de la dégénéréscence sont discutés. Les conclusions suivantes sont permises: (1) Un examen de différentes sections de la tumeur révélera une plus grande fréquence de dégénéréscence sarcomateuse. (2) Tous les myomes ordinaires ne présentent pas la même structure et il peut avoir des accélérations temporaires de développement dans certaines aires. (3) Des sections isolées suspectes ne doivent pas être considérés comme sarcomateuses. (4) Il faut différentier entre fibro-sarcome et adenomyose. (5) Une petite section de sarcome dans un fibrome typique ne justifie pas le diagnostic de sarcome. (6) Le curettage diagnostique a peu de valeur. (7) On pratiquera la panhystérectomie dans les cas suspects chez les femmes ayant passé la ménopause. (8) Le sarcome de l'utérus n'est pas radio-sentitif. (9) La x-ray thérapie profonde postopératoire sera pratiquée dans tous les cas de dégénéréscence sarcomateuse de fibromes utérins.

Выводы

В серии 153 операций по поводу фибромы матки автор обнаружил 2 случая саркоматозной дегенерации, т. е. 1,3%.

Эти 2 случая демонстрируют, и автор дает очерк дифференциальной диагностики и касается лечения саркоматозной дегенерации. Автор приходит к следующим выводам: 1) Тщательное исследование разных участков опухоли, а не исследование только подозрительных очагов дает большую возможность распознать большее количество случаев саркоматозной дегенерации; 2) Обычная миома матки дает разнообразную гистологическую картину. Миома может давать временное местное ускорение своего роста; 3) Изолированные подозрительные области должны быть рассматриваемы, как проявление саркоматозной дегенерации; 4) Хеобходимо уделить больше внимания дифференцировке фибросаркомы и аденомиозиса; 5) Небольшой саркоматозный очаг в "чистой форме" фибромы матки являтся еще поводом для отнесения этой матки к саркоматозной; 6) Диагностическое выскабливание не представляет клинической ценности; 7) Удаление матки рекомендуется у женщины, находящейся в послеродовом периоде и у которой обнаружены подозрительные саркоматозные участки. 8) Не следует прибегать к полной панхистеректомии с удалением придатков у женщины в послеродовом периоде; 9) Саркома матки не чувствительна к радиолучам. Глубокая терапия х-лучами должна проводиться во всех случаях саркоматозного перерождения фибромы.

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Apreciaciones sobre la Pelvis de la Mujer Oaxaquena*

(Considerations on the Pelvis of Women from Oaxaca)

MANUEL CANSECO LANDERO, M.D.
OAXACA, MEXICO

SUMMARY

The author has measured 3,464 pelves of women from the state of Oaxaca, and has calculated the averages of each diameter. He has found lower figures than those given by the French. The pelves of the Oaxaca women are abnormal and of the flat and uniformly contracted type. The diameters for comparison are as follows:

Oaxaca: Anteroposterior 17
France: Anteroposterior 20
Oaxaca: Bi-spinous 22
France: Bi-spinous 24
Oaxaca: Bi-crestal 27
France: Bi-crestal 28
Oaxaca: Bi-trochanteric 30
France: Bi-trochanteric 32

ES PRINCIPIO fundamental en pelvimetría que para estimar las dimensiones de los diámetros externos debe tenerse en cuenta, además de la longitud de estos diámetros, la proporción que existe entre ellos y se ha aceptado entre nosotros el promedio indicado por los autores, especialmente los franceses, que nos dan las cifras de 20, 24, 28 y 32 como normales y hacen la salvedad que puede considerarse una diferencia de dos centímetros en cada uno de ellos, sin que ésta circunstancia quiera decir dicha pelvis no es normal.

Sobre esta base se estiman las dimensiones y proporciones de todas las mujeres embarazadas y se catalogan como normales las pelvis que guardan dichas dimensiones y proporciones.

Desde mis años de estudiante, en que sentí verdadera afición por el estudio de la Obstetricia, observaba con mucha frecuencia que las cifras indicadas en el texto no coincidían con las recogidas al efectuar las pelvimetrías en la Clinica; por otra parte observé multitud de ocasiones que a pesar de esta circunstancia los partos eran fisiológicos o por lo menos, si había distocia, no era consecutiva precisamente a la desproporción de la pelvis.

Después al hacerme cargo de la cátedra de Obstetricia en el Instituto de Ciencias del Estado, hace once años, en el Centro de Higiene Infantil de los Servicios Sanitarios, en la Casa de Maternidad del Gobierno del Estado y en el ejercicio profesional, procuré ir haciendo la observación cuidadosa de las pelvis de todas las enfermas que estaban a mi alcance y formé una pequeña estadística que a la fecha comprende 3,464 casos sobre los cuales considero que ya pueden sacarse algunas conclusiones.

Las pelvimetrías que he recogido han sido tomadas en mujeres entre los 18 y los 40 años, la mayoría multíparas y todas gestantes.

* Presented at the Third International Assembly of the International College of Surgeons held in Mexico City, August, 1941.

Los resultados de la observación de esta estadística deben tomarse en cuenta, en mi concepto, porque las proporciones de todas las pelvis medidas son casi uniformes y por otra parte el número de observaciones recogidas, ya me parece suficiente para autorizarnos a deducir una conclusión sobre este asunto.

Analizando de una manera general las cifras recogidas puede decirse que las pelvis examinadas son más pequeñas que las que indican los libros como normales, pues solo hay 8 que coinciden con las medidas clásicas que hemos venido aceptando hasta ahora; el resto varía considerablemente; pero aún dentro de esta variación, se nota que oscila dentro de ciertos límites, constituyendo un tipo especial de cintura ósea de nuestras mujeres, característico, que difiere de la "pelvis tipo" preconizada por los parteros europeos.

Entrando en detalles respecto a la medida de cada diámetro, puede observarse que el anteroposterior es el que mayormente varía, encontrándose por término medio 17 centímetros.

El diámetro biespinoso da un promedio de 22 centímetros.

El diámetro bicresto mide en la mayoría de los casos 27 centímetros y por último el bitrocantereo mide sensiblemente 30 centímetros en casi la totalidad de los casos.

Sentados estos datos y teniendo a la vista el alto porcentaje de las cifras obtenidas con relación al número de pelvis examinadas, puede concluirse que los caracteres particulares de las pelvis de nuestras mujeres se definen claramente y constituyen un tipo especial de cintura ósea, distinta de la pelvis europea, pero que representa nuestras características étnicas y biológicas y por lo tanto es la normal entre nosotros.

Si recordamos lo que los autores nos enseñan y tomamos como tipo de pelvis normal aquella que midiera 20, 24, 28 y 32 centímetros, nos veríamos obligados a conceptuar como anormal toda pelvis que se alejara de estas dimensiones y proporciones y en este caso, deberíamos concluir que todas las pelvis oaxaqueñas son anormales; lo que nos haría caer en un error de apreciación, pues debe tenerse en cuenta que las cifras citadas por los autores corresponden a promedios obtenidos por el mismo sistema, es decir por el porcentaje de mediciones múltiples y el resultado de ese trabajo estadístico les dió como conclusión su "pelvis tipo," con sus medidas correspondientes; pero esa "pelvis tipo" es la europea. A nosotros toca el trabajo de caracterizar la "pelvis tipo" mexicana, que seguramente difiere de la anterior como difieren las condiciones raciales, antropológicas, etc. Por otra parte, nosotros por el solo hecho de que no estén idénticas a las europeas, cuando puede observarse, como a diario sucede, que no presentan trastornos distócicos por estas diferencias en la pelvimetría.

Estamos pues autorizados por estas observaciones a establecer como normal entre nuestras pelvis, un tipo especial, característico, que constituye la pelvis normal entre nosotros, aunque difiera de la europea.

Si comparamos ahora nuestra "pelvis tipo," con la pelvis descrita en las obras de texto, encontramos rasgos que la caracterizan amiamente; desde luego puede apreciarse que nuestra pelvis es más pequeña en general que la que se ha venido tomando como normal; por otra parte puede notarse que el diámetro de Baudeloque está más disminuído que los demás, es decir presenta un tipo de "pelvis plana y uniformemente estrecha" según la clasificación de Favre; pero que en este caso no debe considerarse como un vicio de conformación de la cintura pélvica, sino como característica normal

de nuestra pelvis en comparación con la europea.

Teniendo a la vista las cifras obtenidas por las pelvimetrías que he efectuado, he podido observar que los partos se verifican a diario con toda normalidad y nunca he observado distocia pélvica en mujeres que presente las dimensiones de *17, 22, 27,* y *30* centímetros en sus respectivos diámetros.

Siempre he considerado de capital importancia para el estudio de la Obstetricia, formar estadísticas amplias y completas que nos autoricen en definitiva a establecer las características pélvicas de nuestra raza, pues erróneamente se ha venido enseñando en las Escuelas de Medicina del País que la base métrica normal es la europea y llegando al terreno práctico, puede verse que difiere considerablemente de la nuestra.

Ojalá que esta modesta contribución sirva para iniciar en todos los centros obstétricos de la República, la formación de una estadística completa de la pelvis mexicana, estudio que sería de mucho interés para el ejercicio diario de la profesión y que sentaría ante el mundo médico el concepto de que estamos esforzándonos por fundamentar científicamente la medicina mexicana.

SUMARIO

El autor ha medido 3,464 pelvis de mujeres de Oaxaca, y sacado los promedios de cada uno de los diametros.

Ha encontrado que las cifras son más bajas que las europeas hasta el punto de entrar, segun los autores europeos, en la categoría de anormales, de tipo plana y uniformemente estrechada.

Los diametros son, en comparación con los que dá la Escuela Francesa:

Oaxaca: Ant.-Post...17; Bi-espin....22
Francia: Ant.-Post...20; Bi-espin...24
Oaxaca: Bicresta....27; Bitroc.....30
Francia: Bicresta....28; Bitroc.....32

A pesar de esta disminución, el parto se verifica sin distocia de origen pélvico. No puede, pues, hablarse de Anormalidad sino de tipo Étnico.

RÉSUMÉ

L'auteur a mésuré 3,464 pelves de femmes de la province de Oaxaca, et calculé les moyennes de chaque diamètre.

Il a trouvé des chiffres inférieures a celles données par les auteurs français, jusqu'au point d'entrer, selon la classification française, dans la catégorie d'anormaux, du type plat uniformément rétreci.

Les diamètres sont, en comparaison avec les chiffres données par l'École Française:
Oaxaca: A-p 17; Bi-épin. 22; Bi-crête 27; Bitroch. 30.
France: A-p 20; Bi-épin. 24; Bi-crête 28; Bitroch. 32.

Cependant, l'accouchement se fait sans dystocie d'origine pelvienne. On ne peut donc pas parler d'anormalité, mais de Type Ethnique.

Выводы

Автор провел измерение женского таза в 3464 случаях, в штате Оксака и вывел средние цифры каждого диаметра.

Он нашел более низкие цифры, чем те, которые приводятся Френчем (French).

Таз женщины штата Оксака отступает от нормы, от приплюснутого и единообразно суженного типа.

Для сравнения приводятся следующие диаметры:

Оксака: переднезадний 17
Франция " 20
Оксака: биспинальный 22
Франция " 24
Оксака: межгребешковый 27
Франция " 28
Оксака: межтрохантериальный....30
Франция ' 32

Técnica Simplificada para la Dacriocistorrinostomía*

(Simplified Technic for Dacriocystorrinostomy)

A. TORRES ESTRADA, M.D., F.I.C.S.
MEXICO, D. F.

SUMMARY

The author considers the treatment par excellence for dacryocystitis to be the external operation of dacryocystorrhinostomy. This operation has not come into general favor due to the difficulties encountered in closing the incision accurately by means of the mucomucosal suture. The suture resorted to via the endonasal route, combined with an external approach, is practical, relatively secure, and gives good results.

SIN duda uno de los padecimientos oculares más molestos es la dacriocistitis, por la epífora constante que nubla la visión precisamente cuando el paciente dirige la mirada hacia adelante y abajo para ejecutar algún trabajo manual, la escritura, la lectura, etc. El fenómeno es debido al prisma de lágrimas que se forma entre el párpado inferior y el globo ocular, y que llega a interponerse parcialmente en el campo pupilar. Esta nublazón desespera al enfermo y lo imposibilita para ejecutar trabajos delicados. Por otra parte, el foco séptico constituído por el saco lagrimal infectado no sólo constituye una amenaza para la integridad del ojo, que puede enfermarse y aún perderse, sino que, el continuo contacto de las manos del paciente con la secreción purulenta del saco lo incapacita para aquellos trabajos que requieren manos limpias (medicina, enfermería, preparación y venta de comestibles, etc.).

Como se vé la dacriocistitis, a pesar de no ser en sí un padecimiento grave, por no afectar directamente al globo ocular, sino a uno de sus anexos, es de gran importancia y tiene una trascendencia social digna de atención, circunstancias que habitualmente no se le reconocen.

De lo anterior se desprende la necesidad de emplear para el tratamiento de este padecimiento un método capaz de suprimir esta invalidez relativa del paciente, eliminando al mismo tiempo la epífora y el estado séptico del saco lagrimal.

Esto solo es posible conseguirlo de dos maneras: Restableciendo la permeabilidad de las vías lagrimales obstruídas, o creando una comunicación artificial entre el saco lagrimal y la cavidad nasal.

En consecuencia todo tratamiento de las dacriocistitis que no se ajuste a estas dos condiciones resultará incompleto y defectuoso.

De acuerdo con estas indicaciones lógicas se ha tratado de restablecer la permeabilidad de las vías lagrimales por medio del cateterismo, por la aplicación

* Presented at the Third International Assembly of the International College of Surgeons, held in Mexico City, August, 1941.

de una cánula dejada a permanencia en el canal nasal, y por la dilatación forzada de las vías excretoras por medio de sondas gruesas. El cateterismo de las vías lagrimales empleado por Bowman el año de 1850 con el objeto antes indicado es el único de estos métodos antiguos que ha podido llegar hasta nuestros días como un recurso útil. Desgraciadamente sus indicaciones están limitadas casi de una manera exclusiva a los casos de estenosis o de obstrucciones recientes y a las dacriocistitis del lactante por obstrucción congénita de dichas vías. Es impracticable en los casos de obstrucción antigua, y tienen como inconvenientes, ser un tratamiento muy doloroso, muy prolongado y de resultados muy inconstantes. Por este motivo en mi práctica hospitalaria y en la clientela particular limito el cateterismo a 6 u 8 sesiones, y juzgo que es inútil continuar el tratamiento por más tiempo si para entonces no se ha restablecido el paso normal de las lágrimas. Por otra parte, el cateterismo ocasiona a veces desgarros del punto lagrimal, estenosis y obstrucciones de los canalículos como consecuencia de una falsa vía, cuyos inconvenientes constituyen una dificultad seria para emplear posteriormente un tratamiento más eficaz.

Los inconvenientes del cateterismo y sus fracasos frecuentes hicieron idear la manera de crear una comunicación entre el saco lagrimal y la cavidad nasal lo cual se ha logrado en la actualidad mediante la dacriocistorrinostomía. Creo que debe asentarse como un criterio ya bien definido que se debe practicar esta operación cuando el cateterismo sea impracticable, o si después de haberlo practicado la epífora continúa o reaparece. La intervención resulta menos molesta para el paciente que un cateterismo y proporciona resultados muy constantes y altamente satisfactorios.

Los métodos destructores del saco lagrimal para el tratamiento de las dacriocistitis eran conocidos desde las épocas más antiguas de la Medicina. En efecto desde Galeno y Celso, hasta la invención del cateterismo de las vías lagrimales, el tratamiento había consistido en la destrucción del saco por el cauterio o los agentes químicos. No fué sino en época relativamente reciente o sea el año de 1858 en que Berlin dió a conocer la extirpación del saco lagrimal cuyo método operatorio hasta la fecha es empleado por la mayor parte de los cirujanos oculistas.

Siendo la extirpación del saco una operación tan universalmente aceptada, creo indispensable detenerme un poco para juzgar de sus ventajas e inconvenientes.

La ventaja principal de la extirpación del saco, consiste en la eliminación del foco séptico, lo cual le podría dar la preferencia en aquellos casos en que posteriormente se tuviere que practicar una operación en el globo ocular.

A cambio de esta ventaja capital tiene varios inconvenientes.

A. Es una operación mutilante e imposibilita al órgano de excreción lagrimal para un tratamiento posterior más completo y racional.

B. Es antifisiológica y deja el síntoma más molesto para el enfermo, que es la epífora.

C. No es verdad que la epífora tienda a disminuír con el tiempo, como es la creencia generalmente aceptada. De todas maneras aunque disminuya todavía resulta ser tan molesta para el paciente como antes de haber sido practicada la operación.

D. Es frecuente que la operación se haga incompleta lo que da por resultado que el paciente continúe con la epífora y la blenorrea del saco lagrimal.

DACRIOCISTORRINOSTOMÍA

Los primeros intentos dignos de tomarse en cuenta, para hacer una comunicación entre el saco lagrimal y la nariz, remontan a principios del siglo XVIII con Woolhouse, quién obtuvo algunos éxitos transitorios dejando a permanencia una cánula de oro que atravesaba el ancho espesor de la pared nasal. Posteriormente la cánula se eliminaba y la comunicación se obstruía. Después, hasta el año de 1914 Toti señala nuevamente la posibilidad de hacer dicha comunicación practicando una amplia trepanación de las paredes de la cavidad nasal. Por esa misma época algunos rinólogos como Calwell, Passow y otros más idearon establecer dicha comunicación por vía endonasal y sus trabajos fueron los precursores de los métodos de West, Polyack, Yankauer y otros más, que en la actualidad se practican. Finalmente Ohm el año de 1914 y más tarde Dupuy Dutemps, resolvieron satisfactoriamente el problema de obtener una comunicación perfecta y con resultados definitivos, mediante la sutura de la mucosa del saco con la de la cavidad nasal.

Los métodos de dacriocistorrinostomía interna, o endonasal reposan en la posibilidad de establecer una comunicación entre la parte más inferior del saco lagrimal y las primeras porciones del canal nasal, por ser el punto más cercano de estas vías con la cavidad nasal, detalle que puede apreciarse claramente en la Figura 1 que corresponde a un corte horizontal practicado inmediatamente abajo de la comunicación del saco lagrimal con el canal nasal. No es posible practicar suturas entre el colgajo de mucosa nasal y las paredes del saco, lo cual da a la dacriocistorrinostomía interna una grand inferioridad con relación a la dacriocistorrinostomía externa. Por otra parte, en la práctica no es siempre posible encontrar una pared ósea bastante delgada que permita el fácil abocamiento de las cavidades. En cambio, es de tener en cuenta que las vías lagrimales están prácticamente incluídas en el etmoides anterior y demás huesos que forman la pared nasal externa y que las dacriocistitis son la consecuencia de osteitis y demás inflamaciones de esta pared. Una comunicación más o menos pequeña entre el saco y la nariz sin suturas mucomucosas a través de la pared huesosa más o menos enferma predispone a un fracaso ulterior; y de hecho la dacriocistorrinostomía interna no proporciona los resultados brillantes que la dacriocistorrinostomía externa.

Es de llamar la atención que haya sido preciso al transcurso de tantos años y de innumerables intentos, seguidos de fracaso para encontrar la solución del problema en una regla tan elemental de cirugía general como es la de practicar

Fig. 1. Corte horizontal immediatamente debajo comunicación saerolagrimal en canal nasal.

la sutura entre las paredes de dos cavidades entre las que se quiere establecer una anastomosis. Y es todavía más de

llamar la atención cómo esta operación, siendo ya una realidad tangible en manos de algunos cirujanos, todavía no haya tenido la generalización que debería tener y que han tenido otros métodos operatorios y terapéuticos de resultados relativamente menos seguros, como la diatermocoagulación en el despegamiento de la retina y el propio cateterismo en las dacriocistitis.

Las razones por las cuales no se ha generalizado la dacriocistorrinostomía no dependen de que esta operación sea de resultados inferiores a la extirpación del saco lagrimal, ni porque esta operación proporciones resultados bastante aceptables en la práctica. La verdad es que el hecho de seguir empleando una operación mutilante recibe algunas concesiones de quienes la practican; pero seguramente la extirpación del saco que cuenta aún con innumerables partidarios acabará por ser abolida.

Indudablemente que la principal razón por la cual la dacriocistorrinostomía no se ha generalizado es lo difícil y laboriosa que resulta en relación con la extirpación del saco: otra razón es los malos resultados que se obtienen cuando la operación ha sido mal ejecutada. Es verdad que la dacriocistorrinostomía es una operación difícil y esta dificultad depende de varias circunstancias. Una de ellas es el espesor de la pared ósea que separa el saco lagrimal de la mucosa nasal, que es nada menos que todo el espesor del etmoides anterior, el cual en algunos pacientes puede alcanzar hasta tres centímetros (Fig. 2). Otra dificultad es la fragilidad de los colgajos de la mucosa nasal que se desgarran con sólo tomarlos con una pinza, y que hace imposible deslizarlos, estirarlos y cualquiera otra manipulación necesaria para practicar una autoplastía. Por último, la estrechez del campo operatorio limitado por paredes rígidas como son las de la trepanación hecha en el hueso, la profundidad a la que se va encontrar dicha mucosa; la vascularización de la región y la circunstancia de que unas cuantas gotas basten para inundar constantemente de sangre el campo operatorio, lo que impide la visibilidad de algunas maniobras y hace que la intervención se

Fig. 2. Muestra pared ósea entre-saco lagrimal y mucosa nasal.

alargue de un modo extraordinario. Sin embargo todas estas dificultades pueden ser dominadas con una buena preparación del paciente, y en cuanto a las derivadas de las condiciones anatómicas es posible vencerlas con mayor facilidad mediante una técnica operatoria simplificada. La técnica que ahora tengo el honor de presentar a esta Honorable Asamblea es en mi concepto una técnica fácil, accesible a cualquier cirujano; y segura con un porcentage de éxitos no menor de un 95 por ciento. Su tiempo de ejecución varía entre 25 y 30 minutos y las dificultades eventuales que se pudieran presentar se compensan grandemente con las ventajas de la intervención.

PROCEDIMIENTO PERSONAL

Instrumental. — Como instrumentos generales uso los siguientes: bisturí fino, tijeras romas, curvas y finas, pinzas

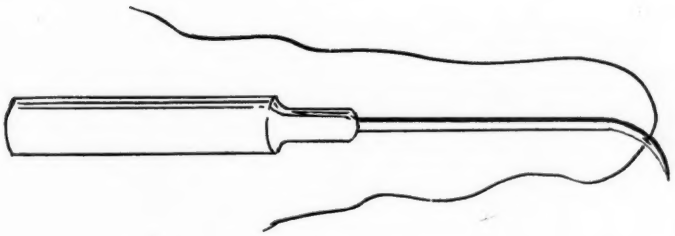


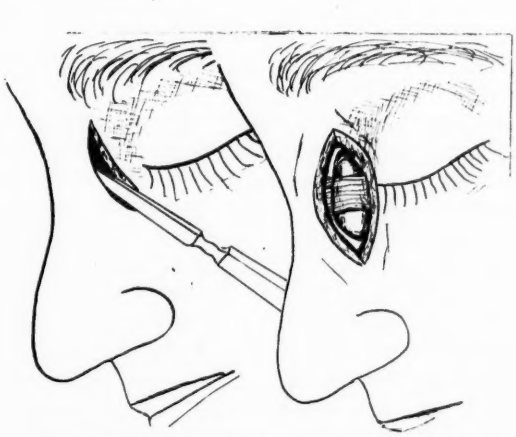
Fig. 3. Aguja larga de diseño especial con ojo y curvatura hacia la punta.

acodades para curaciones nasales, separador de Müller, dilatador de puntos lagrimales, sonda Bowman Núm. 1, martillo, cuatro pinzas hemostáticas finas, aguja de sutura mediana, portagujas, aguja de Reverdin chica y recta, un espejo de Klaar. Como especiales empleo: dos pinzas fuertes para curaciones dentales, cincel fino recto, o acodado en balloneta para mastoides, palanca pequeña, fuerte y acodada en ángulo casi recto, agujas largas, montadas en un mango, de diseño especial con ojo y curvatura hacia la punta (Fig. 3).

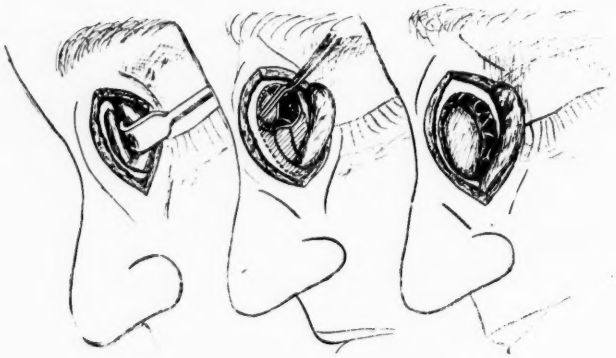
Anestesia. — Anestesia local por infiltración, con una solución de novocaína adrenalina al 2 por ciento, o de percaína al 2 por 1.000, completándola por medio de un tapón de algodón impregnado en solución de cocaína al 5 por ciento con adrenalina, introducido en la parte alta de la nariz.

Manual Operatorio.—Incisión clásica, la misma que se usa para la extirpación del saco lagrimal y para la dacriocistorrinostomía de Dupuy Dutemps (Fig. 4).

Segundo tiempo: Disección de la piel y partes blandas—por medio de las tijeras romas hasta descubrir el tendón del orbicular de los párpados, después aplicación del separador de Müller, haciendo en seguida la hemostasis y dejando claramente visibles la porción del ligamento ancho de los párpados que se inserta al borde orbitario, el tendón del



Figs. 4 y 5. Incisión clásica para extirpación sacrolagrimal.



Figs. 6, 7 y 8. 3° tiempo. 4° tiempo.

orbicular y el borde de la órbita (Fig. 5).

Tercer tiempo: Sección del tendón y de la fascia, disecando cuidadosamente la pared interna del saco, hasta dejar al descubierto toda la canaladura del ungüis y la cresta lagrimal posterior (Fig. 6).

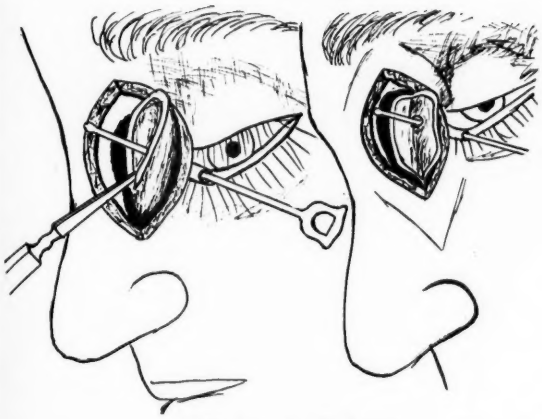
Cuarto tiempo: Sección por medio del cincel y el martillo de la porción anterior de la pared, aplicando el filo del instrumento dos o tres milímetros por detrás de la cresta lagrimal anterior y perpendicular a la superficie del hueso (Fig. 7).

Bastan generalmente dos o tres golpes de martillo para que se desprenda el borde de la cuña del hueso perteneciente a la apófisis ascendente del maxilar superior, y que se insinúa dentro del etmoides. Para extraer estas esquirlas y algunas otras pequeñas que a veces se forman durante la sección, se hace uso de una palanca acodada, pequeña y fuerte, no habiendo encontrada otra mejor que un limpiador del sarro de los que usan los dentistas, cuya punta fina y a la vez cortante, sirve para enganchar los fragmentos y disecar las adherencias que pudieran conservar con las partes blandas. Se continúa la trepanación sobre la porción eburnea de la pared por golpes finos del cincel ampliándola hasta tres o cuatro milímetros por delante de la cresta lagrimal anterior.

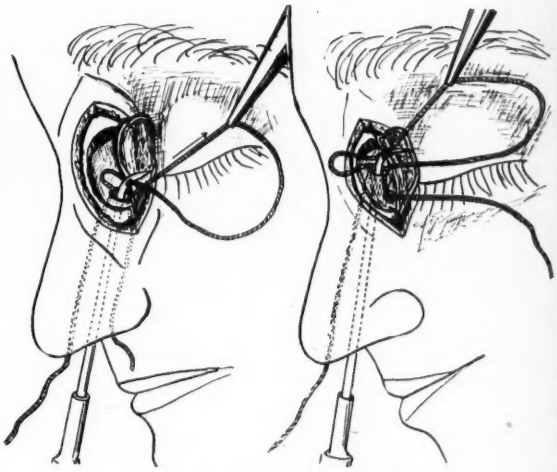
Extraídas las esquirlas de la porción dura, se elimina por completo el cincel y el martillo. En seguida con la pinza dental se arrancan las delicadas trabéculas huesosas que forman las paredes y tabiques de las celdillas etmoidales. La trepanación terminada debe tener una forma oval, y sus dimenciones han de ser dos centímetros de largo por uno y medio de ancho. La mucosa nasal debe aparecer en el fondo de la trepanación absolutamente intacta y tensa, como si se tratara de la tela restirada en un marco oval (Fig. 8).

Quinto tiempo: Se retira el separador de Müller y se introduce una sonda por el punto lagrimal inferior hasta la cavidad del saco; hecho lo cual se aplica nuevamente el separador de Müller.

De esta manera se tiene una referencia segura para hacer la sección del saco, principalmente en aquellos casos en que es pequeño o retraído, y aún en aquellos casos en que una defectuosa extirpación del órgano ha regenerado un saco rudimentario, pero lo suficiente para formar dos pequeños colgajos susceptibles de suturarse a la mucosa nasal. En seguida se divide longitudinalmente el saco para



Figs. 9 y 10. 5° tiempo.



Figs. 11 y 12. 6° tiempo.

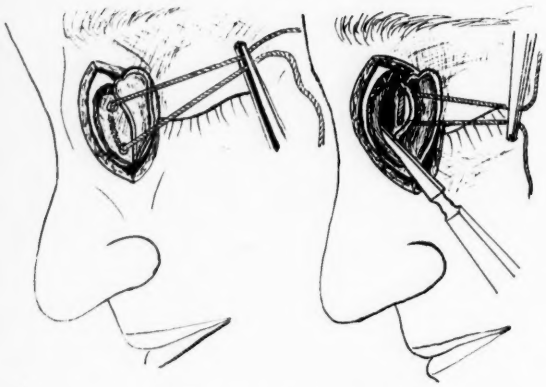
lo cual se hace en sus paredes y sobre la sonda, un ojal con la punta del cuchillo, y se continúa la sección por medio éste, o con unas tijeras, haciendo dos colgajos cuadrangulares uno anterior más corto, constituído por la pared anterior y el tendón del orbicular, y uno posterior, más largo, que comprende la pared interna y posterior (Figs. 9 y 10).

Sexto tiempo: Es el más importante, o sea la sutura, para lo cual se introduce por la nariz la aguja especial diseñada por mí, enhebrada con un hilo de catgut 00 y como de 20 centímetros de largo, la punta del instrumento debe mirar hacia atrás, y la convexidad debe guiarse por debajo del dorso de la nariz.

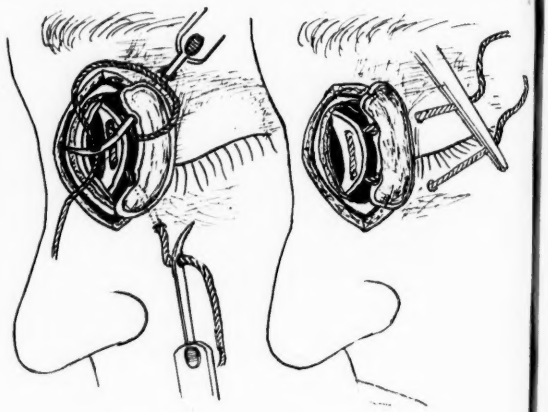
Cuando la aguja ha llegado hasta la trepanación, lo que se conoce en que la mucosa se levanta con los movimientos del instrumento, es fácil orientarla de manera a que la punta venga a salir atravesando la mucosa hacia la unión del tercio medio con el inferior del eje mayor del óvalo de la trepanación, se toma entonces con una pinza fina el cabo del hilo que está por la concavidad de la aguja y con todo cuidado se jala llevándolo al exterior del campo operatorio (Fig. 11).

En seguida se retira un poco la aguja hacia la cavidad nasal, se vuelve a perforar la mucosa en la unión del tercio medio con el superior del citado eje, arriba de la primera perforación y se jala nuevamente el asa de catgut, comprendida dentro de la curvatura de la aguja, se desensarta y se lleva el hilo afuera de la herida operatoria, evitando hacer tracción y cualquiera brusquedad, que pudiera provocar la desgarradura de la mucosa (Fig. 12). La aguja ya desenhebrada se retira completamente de la nariz y los cabos de la punta en U que se ha ejecutado, y que salen hacia afuera del campo operatorio, se toman con una pinza (Fig. 13).

Séptimo tiempo: Una vez practicada la sutura en U sobre la mucosa nasal se jalan cuidadosamente los hilos para insinuarla hacia la perforación y en seguida, por medio del cuchillo de Graefe, se talla a expensas de ella un colgajo único, en forma de C del tamaño menor que el de la trepanación y pediculado hacia el borde posterior de ésta, para lo cual se pasa casi rasando el filo del cuchillo por los bordes superior, anterior e inferior, de la abertura ósea. Debe tenerse cuidado al ejecutarse esta manio-



Figs. 13 y 14. 7° tiempo.



Figs. 15 y 16. 8° tiempo.

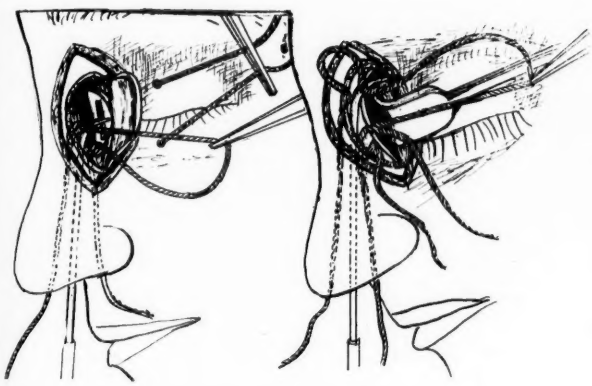
bra de no dividir los hilos de la puntada en U, ni tirar demasiado de ellos para no desgarrar el colgajo, sino hacer una tracción moderada a fin de que el colgajo se recline dentro de la trepanación a medida que se va disecando (Fig. 14)

Octavo tiempo: Se retira enseguida el separador de Müller y se introduce una aguja de Reverdin recta y pequeña, estando cerrada y desprovista de hilo, por un punto situado como un centímetro arriba y fuera del extremo superior de la incisión, atravesando la porción interna del párpado superior y los tejidos blandos subyacentes, se dirige la punta del instrumento hacia el borde libre del colgajo posterior del saco lagrimal, procurando pasar entre la mucosa y la túnica músculo fibrosa de la pared.

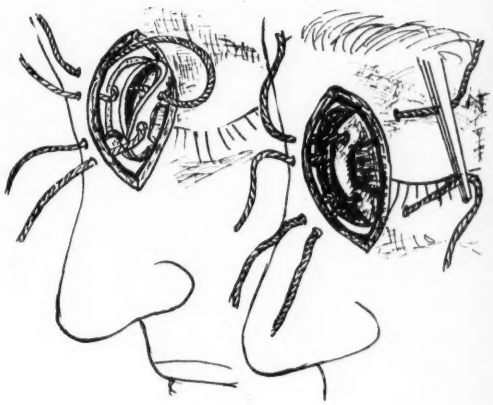
Una vez que la aguja se encuentra dentro de la trepanación y cerca del borde del colgajo de la mucosa nasal se abre y se engancha en ella el cabo superior de la puntada en U (Fig. 15).

Después de haber anhebrado la aguja se retira por su camino, con lo que se hace salir a través de la piel el hilo que sucesivamente ha tomado el colgajo de la mucosa nasal, el colgajo posterior del saco, tejido celular subcutáneo y la piel del párpado superior. Se repite nuevamente la operación haciendo pasar la aguja a través del párpado inferior en un punto simétrico al del párpado superior. Terminando este tiempo quedarán los dos cabos de la puntada en U fuera de la piel, el borde del colgajo de la mucosa nasal afrontado íntimamente al borde del colgajo posterior del saco, y revestida de mucosa la parte anfractuosa y más gruesa de la trepanación, que corresponde a las celdillas etmoidales. Los cabos de la puntada en U se toman con una pinza, y como han pasado por un espesor considerable de tejidos mantiene perfectamente coaptados los colgajos sin necesidad de ninguna otra maniobra (Fig. 16).

Noveno tiempo: Nuevamente se introduce por la nariz la aguja acordada especial, provista de su hilo, y se dirije hacia la trepanación, cerciorándose de que la punta y la concavidad del instrumento miren hacia atrás. En seguida se vascula la aguja hacia el dorso de la nariz con lo cual se pierde de vista la punta del instrumento y se atraviesa la mucosa nasal como a cuatro milímetros antes del borde de la trepanación, en la unión del tercio medio con el superior del borde anterior de ésta: La aguja al atravesar la mucosa pasa entre



Figs. 17 y 18. 9° tiempo.



Figs. 19 y 20. 9° tiempo.

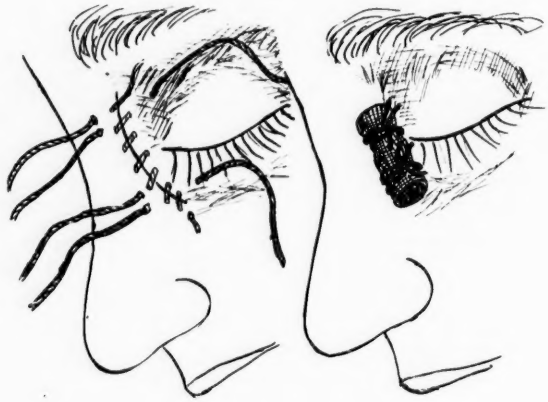
ella y la pared ósea, y cuando nuevamente han aparecido la punta y la curvatura de aquélla dentro de la luz de la trepanación, se toma con una pinza uno de los cabos del hilo, y se lleva al exterior. En seguida se hace retroceder la aguja por su camino, y ya libre dentro de la cavidad nasal se insinúa nuevamente dentro de la trepanación para desensartarla. El cabo del hilo que había quedado en ella se saca el exterior y se sujeta junto con el anterior por medio de una pinza (Fig. 17).

Se retira la aguja y se repite nuevamente la misma operación perforando la mucosa hacia la unión del tercio medio con el inferior del borde anterior de la trepanación. Terminada esta segunda maniobra queda al borde anterior de la mucosa nasal atravesada por dos hilos, de cuyos cabos una sale entre la mucosa y la pared huesosa y el otro viene de la cavidad nasal a través de la trepanación (Fig. 18). Los cabos profundos se ensartan por medio de una aguja de sutura fina y se hacen pasar uno primero y otro después por el borde del colgajo anterior del saco, el tendón del orbicular y los demás tejidos blandos subyacentes a la piel, después de lo cual se reflejan formando una puntada en U para venir atravesar la piel de atrás hacia adelante a un centímetro adelante y arriba del extremo superior de la incisión, en un punto simétrico al que atraviesa el párpado. Terminada esta maniobra en cada uno de los hilos basta jalarlos con cuidado para ver cómo aproximan el borde anterior del saco hacia el borde anterior de la mucosa nasal en un plano profundo, y el tendón, y los demás tejidos en un plano más superficial (Figs. 19 y 20).

Décimo tiempo: Sutura de la herida operatoria. Terminando el tiempo anterior se unen los labios de la incisión por medio de un surjete hecho con catgut (Fig. 21).

Undécimo tiempo: Anudamiento de los cabos de las puntadas en U. Terminada la sutura se atan los cabos de las puntadas en U que han aproximado los colgajos del saco y la mucosa nasal, sobre un rollo de gasa y se cubre la herida con un apósito y vendaje ligeramente compresivo (Fig. 22).

En la técnica clásica de Dupuy Dutemps y en las demás que derivan de ella, se hace la sutura de los colgajos del saco y los de la mucosa nasal por vía externa, en la profundidad del campo operatorio.

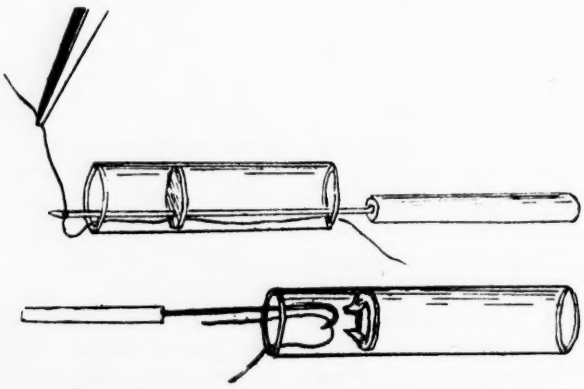


Figs. 21 y 22. 10° tiempo.

A pesar de las agujas especiales ideadas para el objeto, la maniobra resulta muy difícil, a veces casi imposible, y es frecuente el caso que después de una penosa labor que puede prolongarse por una y hasta dos horas el resultado sea que no se hay podido colocar ninguno de los cuatro puntos separados que deben fijar los colgajos del saco a la mucosa nasal, porque ésta se ha desgarrado durante las manipulaciones, y sobre todo en el momento de correr y anudar los hilos de las suturas.

Todo cirujano que ha intentado hacer una dacriocistorrinostomía clásica queda desalentado por la enorme dificultad de practicar dicha sutura; y casi de una manera exclusiva a esta dificultad se debe, que después de tantos años de perseguir con ahinco la idea de realizar la operación, ésta no haya podido entrar en la práctica corriente.

Por muchos años busqué y ensayé encontrar la forma de hacer la sutura mucomucosa de manera fácil y segura. Las maniobras que hace una bordadora, cuando a través de la tela restirada en un bastidor pasa la aguja de abajo hacia arriba y de arriba hacia abajo para ejecutar las labores de su costura, me die-



Figs. 23 y 24. 1° experiencia. 2° experiencia.

ron una luz para hacer la sutura en la dacriocistorrinostomía sin necesidad de manipular la mucosa nasal, sin necesidad de correr hilos, sin hacer nudos en el estrecho y profundo campo operatorio, a fin de hacer que las maniobras de sutura fueran lo más fácil, lo más seguro y lo más rápido de ejecutar.

La técnica que he descrito satisface estas condiciones, porque la aguja larga y casi recta que lleva el hilo ensartado cerca de la punta se introduce por la nariz hasta perforar la mucosa nasal, tensa como en un marco en el fondo de la trepanación de la pared nasal. La aguja entonces atraviesa la mucosa de una manera semejante que la aguja de la bordadora atraviesa la tela colocada en el bastidor. Los hilos que hacen la puntada en U tomando los colgajos de la mucosa nasal los aproxíman con suavidad a los colgajos del saco lagrimal sin necesidad de tocarlos con ningún instrumento que los pudieran desgarrar. Después dichos hilos atraviesan todo el espesor de las partes blandas y se anudan como una simple precaución fuera de la piel, porque los colgajos ya han quedado definitivamente y correctamente aproximados, con lo cual se evita la necesidad de correr los hilos y hacer las suturas en el fondo de la herida, como se hace en los otros procedimientos.

Dos simples experiencias que ilustro por cinco figuras bastarán para demostrar claramente la manera de hacer la sutura mucomucosa en los procedimientos clásicos y en el que acabo de describir.

Prepárense dos tubos pequeños de vidrio, de poco más de 1 c.c. de luz por 5 o 6 de largo y péguese un pequeño diafragma de papel a 2 cms. de uno de sus orificios.

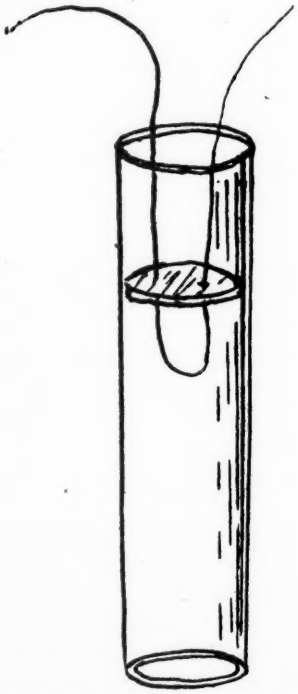


Fig. 25. 2° experiencia.

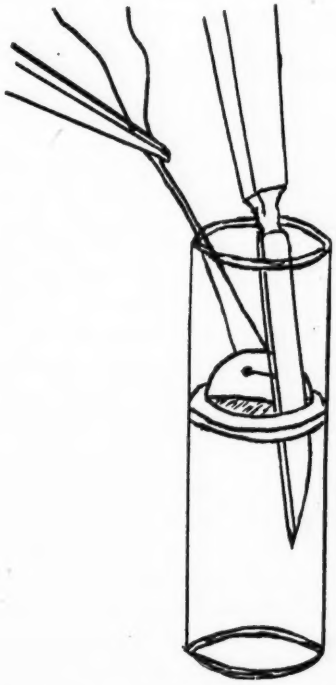


Fig. 26. 2° experiencia.

Este orificio será el representativo de la herida operatoria; la distancia entre él y el diafragma, la profundidad del campo operatorio; el diafragma, la mucosa nasal, y la parte del tubo comprendida abajo del diafragma, la cavidad nasal.

Primera experiencia: Con uno de estos pequeños dispositivos inténtese hacer dos suturas en los colgajos previamente tallados en el diafragma de papel, según la técnica clásica de la dacriocistorrinostomía, y se verá que es casi imposible la ejecución correcta de la maniobra, aunque se empleen las agujas más apropiadas (Fig. 23).

Segunda experiencia: Con otro tubo como el anterior y una aguja con ojo cerca de la punta, semejante a la que he mandado construír para la intervención, hágase pasar un hilo de abajo hacia arriba através del diafragma de papel, retírese la aguja un poco y vuélvase a repetir la operación, con lo cual se habrá hecho una puntada en U (Figs. 24 y 25).

Después con un cuchillo fino hágase una sección curva en el diafragma y se habrá obtenido un colgajo sujeto por la puntada en U (Fig. 26).

El resultado de estas experiencias es demostrar que es posible obtener una puntada en U en el colgajo de papel sin que para esto haya sido necesario manipularlo en lo absoluto con ningún instrumento, que es precisamente lo que se hace en el colgajo de mucosa nasal en la técnica operatoria que acabo de describir.

Para terminar debo manifestar que con esta manera de hacer la sutura mucomucosa no sólo se facilita su ejecución, sino que se logra hacerla perfecta en casi todos los casos. Los contratiempos pueden venir de que la mucosa se desgarre antes de practicar la sutura, pero aún en estos casos es posible practicarla con más o menos facilidad y seguridad.

Los resultados operatorios en esta operación, tal vez más que en ninguna otra dependen de la perfección con que haya sido ejecutada, y la mejor demostración de que es fácil y segura es el gran número de casos en que puede efectuarse pagada a la técnica. No es por lo tanto de extrañar el gran porcentaje de éxitos que he señalado al principio de este trabajo.

Los fracasos no dependen en gran parte de que la sutura mucomucosa haya sido incompleta, sino de las condiciones de las vías lagrimales superiores y de la formación de queloides en la cicatriz operatoria.

En efecto, la desviación de los puntos lagrimales, el desgarro o la desbridación que hayan sufrido estos, así como las estenosis de los canalículos lagrimales, son los motivos más frecuentes de que la operación fracase.

El fracaso debido a la queloides puede evitarse aplicando rayos X cuando ésta comienza a formarse, o bien reoperando al paciente si ésta se ha formado y haciendo días después la irradiación conveniente.

SUMARIO

El tratamiento quirúrgico por excelencia de la dacriocistitis es la dacriocistorrinostomía externa.

La dacriocistorrinostomía no se ha generalizado debido a las dificultades de hacer una correcta sutura mucomucosa.

La sutura mucomucosa por maniobras endonasales combinadas con las externas es fácil, segura, y permite obtener éxitos constantes.

RÉSUMÉ

L'opération externe de dacryocystorrhinostomie est le traitement chirurgical par excellence de la dacryocystite. L'opération n'est pas devenue populaire vu les difficultés qu'on recontre pour fermer l'incision avec exactitude au moyen d'une suture muco-muqueuse. Cette su-

ture, faite par la voie intranasale est pratique, sûre et donne de bons résultats.

Выводы

Автор считает, что найлучшим лечением дакриоцистита является наружная операция — дакриоцисториностомия.

Эта операция не получила широкого распространения из-за трудностей, встречаемых при закрытии разреза швами, которые должны соединить края слизистой оболочки.

Практикуется шов, относительно безопасный и дающий хорошие результаты, который накладывается эндоназально, но сочетается с наружным подходом.

(Continued from page 133)

A priceless gift that all mankind may share.

Weir Mitchell.

Comments: Dr. Wolcott thinks 'anaesthesia by inhalation' is preferable and I concur.

Cameron Forbes, who belongs to the Jackson tribe, which resents very much the recognition of Morton, lighted on the word 'discovery' in the quotation from Morton, and I think that it would be well to avoid it, although not on the grounds which he raised. The real scientific discovery is that of the anaesthetic properties of a volatile agent and this does not belong to any of the claimants—Long, Wells, Jackson or Morton. Morton did more than anyone else to demonstrate the applicability of this discovery to surgery—to get rid of this vulnerable point in the inscription and at the same time retain the quotation from Morton the forms II, III, or IV are suggested. As stated, if it is not necessary to insert a quotation from Morton at all, I prefer the simple statement marked I.

Perhaps you can find a quotation from Morton which will remove the difficulties.

The quotation which Morton's daughter, Mrs. Otis, wishes used seems to me impossible for the tablet. It is "I have a work to do in this world. The time will come when I will (shall) do away with pain."

No scientific man would indulge in such a boast beforehand. The quotation which I substituted for this I found in Rice's book "Trials of a Public Benefactor." P. 301.

Perhaps you can find something better than either in the rather rare Morton literature, which he got out in circular and pamphlet form, soon after Oct. 14, 1846—

As regards the words 'safe, certain and complete' these, as you know, were employed by the older Henry J. Pigdon to indicate what Morton did and his predecessors did not. They have become a kind of formula, at least in Boston, and I think it well to retain them, as I agree that they describe pretty accurately the points characterizing Morton's accomplishment as compared with Long and Wells, although the main thing is that Morton's achievement became known to the world and started the new era.

Very sincerely yours,
William H. Welch.

Baltimore, August 1, 1920.

My Dear Garrison,

. . . I have been more interested in Morton than in any other candidate of the medical group [to elect him in the Hall of Fame], and he would doubtless be elected, if the electors were not bombarded with documents, circulars, letters, setting forth the claims by Long and Jackson. If the mind of the profession is confused about the rival claimants, how much more the lay mind! I wish there could be more of a consensus of opinion in the profession and, as obviously only one name can be chosen for the Hall of Fame, agreement should be reached to press that of Morton . . . Billings never would vote for Morton. He said Collins Warren deserved the credit . . .

Yours sincerely,
William H. Welch.

From W. H. Welch to James J. Walsh.

December 19, 1927.

My dear Walsh:

. . . The Leipzig Institute is, I think, the only real institute of the history of medicine worthy of the name in the world. My experience confirmed by feeling that a mere "Lehrstuhl," a mere professorship of medical history, is not enough. It needs, just as departments of anatomy, physiology, pathology, etc., its own laboratory or institute with a staff of assistants, equipment in the form of a good working library, etc. There should be on the staff palaeographers, those who can read medieval mss., etc., etc.—all this requires a good endowment.

It is my ambition, if the funds can be secured, to create such an institute in Baltimore . . .

Yours cordially,
William H. Welch.

Welch was a prime mover, a leader and a true humanitarian. His ability and achievements were recognized by the medical profession the world over, and numerous honors and the highest positions in the medical world were conferred upon him. Such genial leaders and educators as Welch are rare. His name is an honor to his teachers and pupils, to his profession, to his country and to mankind.

Editorials

Post-War International Coöperation

FROM all allied countries comes the call for international coöperation after the war. The emphasis with which this desire is proclaimed is in itself an admission that the international coöperation which existed before the war was insufficient. And since our international organizations of physicians and surgeons were among the leading pre-war experiments in such coöperation, it is well, perhaps that we examine our record and frankly face whatever faults we find therein. If we are to avoid the mistakes of the past in the peace to come, we must learn first to recognize those mistakes clearly and fearlessly.

The realignment of the fascist countries is, we well know, a stupendous task which must be undertaken when the war ends. A long period of training in brutality and contempt for the individual human being must be overcome and the new foundations laid for education for humanity. That renaissance is perhaps the greatest of all our postwar problems, and it is confronting us because the great democracies have been in the past so slow to understand that only as they are able to prevent the rise of barbaric concepts ("Weltanschauungen") among their neighbors can they continue long to live according to their own humanitarian ideals. The era of appeasement politics was characterized by the neglect of this essential truth.

The responsibility for the neglect, the short-sightedness, however, does not rest solely with the political leaders, the diplomats and the international business men, as some of us would like to think. The responsibility rests also upon international organizations of men of good will. The fact is that they also have failed in the past.

International medical organizations have been as guilty of appeasement as the statesmen who directed the policies of nations. Too often the leaders—and the rank and file as well—in these organizations have pleaded a privileged position above the struggles of the political arena. Our societies seek pure science, they have said; we have nothing to do with politics. Truth knows no nation, no system of government.

We can see somewhat clearly now that the policy of *laissez faire, laissez mourir* which grew out of our aloofness may have been a contributing cause of today's tragedy.

True, the object of an international medical society is the furtherance of science. But looking back one may question how truly science was served when international gatherings of men of medicine took place in the cities of countries whose governments were, even as the congresses met, notorious for concentration camps, racial persecution, murder and oppression.

Better never to have held those congresses at all than to have, by their holding, tacitly condoned a political philosophy fundamentally destructive of truth and science. For it is well to admit that the scientific profit which an individual participant derives from attendance at a modern international congress is often not at all in proportion to the pomp and splendor surrounding such a gathering.

Which is not to say that the international congresses of medical men have outlived their usefulness. But let us recognize the truth that their mission has changed. They could, if their leaders would assume the responsibility they cannot escape, become important and influential channels for humanitarian education.

In most countries the medical profession is a free profession. This freedom implies an intellectual and material independence which gives to the physician a considerable measure of influence in his community. In his responsibility for the physical and mental health of the community is implied a responsibility also for helping to preserve for all the freedom he himself prizes. Obviously, the noble task of the healer does not end with his duty to himself and his individual patient. It must and should include the well-being of the nation of which he is a member, of the world of which that nation is a part. The effectiveness of our profession can and should transcend national boundaries. The spirit of freedom and healing, like science, is universal.

No medical man has greater power and opportunity to express this spirit than the surgeon. The nature of his work is such that people entrust their very lives to him. So great and unparalleled is the trust that we rightly castigate with utmost severity those who misuse it. But we have been, in the past, too lenient with the betrayal in our own profession and elsewhere of the spirit of freedom and justice and humanity in the realm of social and political relations.

Not one of the international congresses of medical men—and no medical society can be unreservedly absolved of this reproach—openly and unequivocally castigated the crimes committed against mankind in the ten years before the war. Not a single medical society, however much its statutes might emphasize the moral and ethical principles of our profession, excluded from membership men who directly or indirectly supported the barbarities of fascist governments.

We must bear those truths in mind as we face the future. Never before was there greater need and greater opportunity in those free associations of men of all nations committed to the helping and the healing of mankind. Let us resolve, however, that the mistakes of the past shall not be repeated, that we shall, as we go forward, assume the moral responsibility as leaders which the world puts upon our shoulders and which we cannot, with honor, avoid.

Rudolph Nissen

Antireticular Cytotoxic Serum

IN the American Review of Soviet Medicine (December, 1943) it is pointed out that Prof. Alexander A. Bogomolets and his staff have been carrying on research with antireticular cytotoxic serum at the Institute of Experimental Biology and Pathology in Kiev for a number of years. On June 23, 1941, the day following the Nazi attack on Soviet Russia, Bogomolets

announced perfection of the serum, which has been successfully used in thousands of patients suffering from pathologic conditions.

Culmination of years of experimental effort was reached on July 12-14, 1942, at the conference held in Ufa under the auspices of the Institute of Clinical Physiology of the Academy of Sciences of the Ukrainian S.S.R., at which the assembled representatives recommended wide use of antireticular cytotoxic serum for therapeutic use in military hospitals and civilian institutions. Its significance for military use lies in the fact that it shortens the hospitalization period.

Experiments have shown that antireticular cytotoxic serum, if used in small doses, influences the physiologic system of connective tissue and stimulates the mesenchymal cells, in consequence of which the trophic and protective functions of this physiologic system assume paramount importance in diseases characterized by weakening or inhibition of systemic functions, such as hypertension and cancer. Large doses are of no value because they tend to inhibit the physiologic connective tissue system. Experiments in human longevity at the Institute, where a special clinic was established to treat patients over 50, were curtailed by the war.

Various tests have been used to determine reactivity of the physiologic system of the connective tissue: (1) dermal test with trypan-blue; (2) morphology of the blood; (3) sedimentation rate of erythrocytes; (4) titer of complement, opsonic index and phagocytic activity of the leukocytes; (5) dermal test with antireticular cytotoxic serum.

Bogomolets has stated the belief that hypertension is frequently the result of an affection of the normal permeability of the hemato-parenchymal barrier in the kidneys. Treatment has permanently lowered blood pressure to normal, if given in early cases before irreversible sclerotic changes take place.

In carcinogenetic tumors, the fibroblasts and microphages of the tumor tissue form a line of demarcation around the cancerous foci and strangle the carcinogenetic elements, thus hindering the infiltrating growth of the tumor. Antireticular cytotoxic serum stimulates the protective action of the connective tissue. Dr. Neuman's experiments on mice showed that serum treatment led to the disappearance of large carcinogenous tumors and decreased cancer metastases to the lungs.

Dr. Oleg Bogomolets succeeded in accelerating fracture healing and growth of normal bone callosity with small doses of antireticular cytotoxic serum. Use of large doses inhibited osteoblastic growth and caused several months' delay in satisfactory union of fractures.

Administration of antireticular cytotoxic serum in 2500 clinical cases established its efficacy in frostbite and wounds, infectious diseases, diseases of the nervous system and diseases connected with disordered trophic tissue function.

Bone fractures which heal slowly, infected wounds of a slow-healing, sluggishly granulating disposition, purulent infections in the first stages, suppurating inflamed cavities and tissues, frostbite, second and third degree burns, and infected eye injuries respond to Bogomolets' therapy.

Spotted typhus, puerperal and gynecologic sepsis, rheumatism, abscesses of the lungs and pneumonia, tonsillitis, psychoses, traumatic and infectious diseases of the central and peripheral nervous systems, duodenal and gastric ulcers, ozena and eczema are stated to have been favorably influenced.

Use of serum is contraindicated in myocarditis.

Serum for use in humans is prepared from the cells of the spleen and bone

marrow, taken from a fresh human cadaver, with which horses have been inoculated. If necessary, however, an antigen obtained from frozen organs may be used. Dosages in adults range from 0.1 to 0.3 cc. of the serum, determined by the patient's weight and condition, diluted in sterile physiologic saline (1:10) sealed in ampules and stored in a refrigerator two days before injection, either intravenous or subcutaneous.

Bogomolets has made an important and far-reaching contribution to serotherapy with the introduction of antireticular cytotoxic serum. Further publications on this subject will be eagerly awaited. At any rate a vista offering great possibilities for research has been opened by this Russian scientist. It undoubtedly will throw some light on hitherto obscure phenomena.

Max Thorek

IN MEMORIAM

DR. WALTER TAYLOR SHEETS

Dr. Walter Taylor Sheets, F.I.C.S., Salt Lake City, Utah, died in Washington, D. C., in January, 1944.

Dr. Sheets was elected to Fellowship from St. Petersburg, Florida, Mar. 28, 1942, where he was associated as Medical Officer of the Veterans Administration. On June 24, 1942, he was transferred to Salt Lake City, Utah.

An outstanding orthopedic surgeon, he was born in Salt Lake City on Nov. 23, 1902. He received his A.B. degree from the University of Utah in 1924 and his M.D. from the College of Physicians and Surgeons of Columbia University in 1926.

Positions held by Dr. Sheets include: Clinical Instructor in Orthopedic Surgery at the Post-Graduate Hospital, 1930, Chief Surgeon in the U. S. Veterans Hospital, 1932-1940 and Chief Orthopedic Surgeon, U. S. Veterans Hospital, 1940 until his death. Dr. Sheets served as Instructor in Orthopedics in the U. S. Veterans Hospitals, 1932-1944.

With the death of Dr. Sheets the College has lost a devoted fellow.

CHAPTER ACTIVITIES

BOLIVIAN CHAPTER FORMED

THE Bolivian Chapter of the International College of Surgeons was formally inaugurated at an imposing ceremony held in the *Salón de Actos Publicos* of the Universidad Mayor de San Andres at 6:30 P.M. on January 13, 1944.

The inaugural ceremony was a brilliant success. More than a hundred distinguished members of the medical profession, diplomatic authorities and students were in attendance. Guests of honor on this occasion were His Excellency Pierre de Boal, United States Ambassador to Bolivia, Dr. Ernesto Navarre, Vice-Rector of the University and Dr. Héctor Aliaga Suárez, Chief of the Department of Public Health.

The following officers of the Bolivian Chapter were elected:

President, Dr. Enrique St. Loup B.
Vice-President, Dr. Abelardo Ibánez Benavente
Treasurer, Dr. Claudio Calderón Mendoza
Secretary, Dr. Valentín Gómez
National Regents, Dr. Ernesto Navarre
Dr. Enrique Hertzog G.

Fellow Founders of the Bolivian Chapter include:

Anastasio Paravicini
Julio C. Fortún
Walter Galindo
Serafín Ferreira
José Antezana E.
Teodoro von Borries R.
Eduardo Campero Q.

Dr. Enrique St. Loup B.
President Bolivian Chapter.

René Coronel Carvallo
Ricardo Cordoba Coré
Genaro Mariaca
Florentino Mejía G.
Roberto Valda Arana

Dr. Ernesto Navarre, Vice-Rector of the University, presided at the inaugural

The Bolivian Chapter of the International College of Surgeons. Inauguration scene. *Left to right:* Dr. Valentín Gómez; Dr. Claudio Calderón M.; His Excellency P. de Boal, Ambassador to the United States; Dr. E. Navarre, Vice-Rector of the University; Dr. Enrique St. Loup B.; Dr. Enrique Hertzog G.; and Dr. Héctor Aliaga Suárez, Chief of the Department of Public Health.

ceremony, opening the session with a short address welcoming the new organization and stressing its importance to the life of the University.

A splendid discourse was given by Dr. Enrique St. Loup B., in which he pointed out the importance of the formation of the Bolivian Chapter of the International College of Surgeons to Bolivian medicine, especially because of its international character and its stress on advancement of members through individual merit.

Dr. Enrique Hertzog G. spoke of the educational aims of the International College of Surgeons, correlating them with those of the University.

The program was terminated by the showing of a film by Dr. Enrique St. Loup B. depicting the steps in the operative procedure in a subtotal thyroidectomy.

The International College of Surgeons extends its warmest greetings and best wishes to the Bolivian Chapter.

CHINA

CHINESE CHAPTER OF THE INTERNATIONAL COLLEGE OF SURGEONS FOUNDED

THE report of this action was transmitted to the Central Office by Dr. J. Heng Liu, member of the Board of Trustees of the International College of Surgeons.

The following officers were elected:

National President (concurrently Chairman of the Board of Examiners)
Dr. James K. Shen

National Vice-President (concurrently Chairman of the Editorial Board)

Dr. Eugene Chan
National Executive Secretary (National Treasurer)
Dr. Gordon King
3 Members of the Board of Governors
Dr. Charles Chang
Dr. Henry I. Chen
Dr. M. L. Hu

Other Founder Fellows were:

Drs. Allen, A. Stewart
Chang Hsien-lin
Cunningham, Edison R.
Cunningham, Gladys S.
Ho, P. H.
Hsiao, Yuen-Ting
Liljestrand, S. H.
McClure, Robert B.
Nyi, P. C.
Tu, Kai-yuan
Wan, Fu-en
Wang, L. K.
Wang, P. W.
Wilford, E. C.
Yin, Yu-Chang
Yu, Horace
Yuan, Francis T.
Yuan, Shan-Cheng
Yuan, Stephen Y. K.

A Constitution and By-Laws were adopted and at a meeting of the International Board of Trustees a charter granted. The high standing of the surgeons and their innate thirst for the advancement of democratic principles and the art and science of surgery are a guarantee that the Chinese Chapter of the International College of Surgeons will carry the banner of the ideals of the College to its goal of achievement.

The first meeting of the scientific activities of this chapter will be held shortly and the proceedings reported in the *Journal*.

MEXICO

DELEGATES TO UNIVERSITY OF HAVANA, CUBA

VICE-President Manuel A. Manzanilla, F.I.C.S. (Hon.) and Francisco Fonseca García, F.I.C.S. (Hon.) have been appointed special delegates by the National University of Mexico on a mission of rapprochement and university exchange in response to an invitation from the University of Havana, Cuba.

UNITED STATES

NINTH ASSEMBLY OF THE U. S. CHAPTER OF THE INTERNATIONAL COLLEGE OF SURGEONS

THE ninth Assembly of the U. S. Chapter of the International College of Surgeons will be held in Philadelphia on October 3-4-5, 1944.

The following committees have been appointed:

Program Committee

Dr. William Bates, Chm.
Dr. E. L. Eliason
Dr. Drury Hinton
Dr. Thomas A. Shallow
Dr. Desiderio Roman

Exhibit Committee

Dr. John R. Moore, Chm.
Dr. Desiderio A. Roman
Dr. C. L. Jackson, Jr.
Dr. Maxwell F. White (U. S. N.)

Publicity Committee

Dr. Moses Behrend, Chm.

Dr. Clifford B. Lull
Dr. Milton Bodenheimer
Dr. Wm. S. Bainbridge
Dr. Watson B. Morris

Hospital Clinics

Dr. Leonard D. Frescoln, Chm.
Dr. Charles B. Bailey
Dr. Albert P. Seltzer
Dr. Newlin F. Paxson
Dr. Rudolph Jaeger
Dr. Harold Lefkoe
Dr. Everett H. Dickinson (U. S. N.)

Registration Committee

Dr. Wm. L. Martin, Chm.
Dr. Chas. P. Bailey
Dr. Morris A. Weinstein
Dr. Bruce V. MacFadyen
Dr. Leonard Averett

Convocation Committee

Dr. Ernest F. Purcell, Chm.
Dr. Charles A. Steiner
Dr. Edmund C. Hessert

Entertainment Committee

Dr. John E. Loftus, Chm.
Dr. David B. Allman
Dr. Paul N. Jepson
Dr. Theodore C. Geary

Rehabilitation Committee

Dr. Harold D. Corbusier, Chm.
Dr. Wm. S. Bainbridge
Dr. Fred H. Albee
Dr. Custis L. Hall

Housing Committee

Dr. Benjamin H. Shuster, Chm.
Dr. Wm. C. Hunsicker, Jr.
Dr. Leopold Vaccaro

Motion Picture Committee

Dr. Wm. F. Whelan, Chm.
Dr. Moses Behrend
Dr. Thomas L. Doyle
Dr. Earl P. Craig
Dr. Elmer Hess
Dr. Rudolph Jaeger
Dr. John R. Moore

Those desiring to present papers please address the Chairman of the Program Committee, Dr. William Bates, 2029 Pine St., Philadelphia. Those wishing to participate in the Scientific Exhibits address Dr. John R. Moore, 3701 N. Broad St., Philadelphia. Those desirous of obtaining accommodations (This is important!) please communicate promptly with Dr. Benjamin H. Shuster, 1824 Pine St., Philadelphia, Chairman of the Housing Committee, while those who wish to exhibit motion pictures address Dr. Wm. F. Whelan, 2004 Walnut St., Philadelphia.

SCIENTIFIC PAPERS AND DISCUSSIONS

Anyone desirous of reading scientific papers or taking part in discussions at the Ninth Annual Assembly of the International College of Surgeons, to be held in Philadelphia, Oct. 3-5, 1944, please communicate with *Dr. William Bates, 2029 Pine St., Philadelphia, Pa.*

BOOK REVIEWS

Surgery of Modern Warfare. In six parts. Edited by Hamilton Bailey. Part I, pp. 1-152, 165 illus. Part II, pp. 153-328, 146 illus. E. & S. Livingstone, Edinburgh, 1944.

Part I

A PAGE of pointed "Aphorisms for the War Surgeon" introduces Part I of this six-part edition of a popular work on war surgery, compiled under the editorship of Hamilton Bailey with the aid of 76 contributors, two parts of which have now appeared.

Introduction of new technics and numerous revisions make this a valuable reference set. Pictorially, the work is enhanced by the edition of colored illustrations.

In Part I the authors treat (1) of the nature of war wounds and (2) of the general condition and resuscitation of the war wounded. A discussion of foreign bodies, classification of war wounds, the rôle of x-rays in localizing foreign bodies, bacteriology of wounds and chemotherapy comprise Section I. Section II is devoted to a presentation of compression phenomena (crush syndrome and "caisson" disease), shock therapy, and whole blood and plasma transfusions.

Part II

In Part II, frostbite, trench foot, burns, skin grafting, anesthesia of the wounded, general operative considerations (primary excision, débridement, closed plaster treatment), infections (tetanus, gas gangrene), delayed primary and secondary suture, methods of removing foreign bodies, surgical materials and dressings, and maggot therapy in infected wounds are discussed.

Envelope and saline bath treatment of burns, the latter the method of choice in the A. E. F., are fully described, indications and contraindications given, and technics presented.

The authors point out the practicability of the Oxford vaporizer in administering liquid anesthesia, particularly at sea, as well as its value in carrying out artificial respiration.

A special chapter is devoted to x-ray treatment of gas gangrene, not in extensive use in Great Britain. Further trial is recommended before it is practiced extensively.

Attention is called to the revival of antiseptics in wound healing, in disfavor since 1918, but this time in powder form.

Designed to be of assistance to the physician trained in general surgery, these two volumes are also of value to the surgical specialist. Issued in a convenient portable size and printed on paper of good quality in a legible type, nothing has been spared to make this edition of worth to the surgeon called upon to treat war injuries. All in all, the work is timely, an important contribution to contemporary surgical literature, edited by a master surgeon of seasoned experience, whose writings are well known, not only in Great Britain but also on the North American continent, and, in fact, in every part of the civilized world.

M. T.

War Wounds and Injuries. Edited by Rodney Maingot, E. G. Slesinger and Ernest Fletcher and published in collaboration with the Fellowship of Medicine. With a Foreword by Lord Horder. Ed. 2. 550 pp. 35s. Edward Arnold and Co., London, 1943.

THIS useful and comprehensive work, well supplied with bibliographical material, will be a valuable guide to the medical officer in the treatment of war wounds and injuries.

The full, concise treatment of shock, emphasizing the necessity for control of initial shock before performance of major surgery, is followed by a section on burns which describes the use of saline baths, triple dyes and skin grafting.

Detailed descriptions are given of peripheral nerve injuries, chest injuries and their complications, and abdominal injuries. Conclusions stated in the latter instance are the result of a study of six hundred abdominal injuries from this war.

Sulfanilamide cream or sulfanilamide powder covered with Tulle gras is recommended in first aid treatment for facial burns. Facial injuries with fractures are discussed and various operations described. However, there is no mention of the mandibular clamp splint as a means of immobilization.

Joint injuries, compound fractures and amputations of extremities, furnish the subject matter of another chapter.

Other war injuries treated are tetanus, gas gangrene, anesthesia, eye, ear, nose and throat injuries. The latest information on indications and uses of sulfonamides brings this volume up to date. However, there is no mention of peripheral vascular diseases, frequently encountered in base hospitals.

Readable type and a convenient format add to the usability of this compendium of information gathered on war injuries by specialists.

M. T.

Man in Structure and Function. Fritz Kahn, M.D. Translator and Editor, George Rosen, M.D. Published in two volumes. Alfred A. Knopf, New York, 1943.

THIS translation of a book first published twenty years ago in Germany is written for the layman. The author's facile use of analogies from everyday experience make it one of the most easily comprehended books written to popularize scientific knowledge.

The material is logically presented in ten sections dealing with: (1) development of the individual; (2) skeletal framework of the body; (3) human musculature; (4) circulatory system; (5) respiratory system; (6) digestive system; (7) nutrition; (8) nervous system; (9) skin and sense organs; (10) sex.

Dr. Kahn begins with the atom, progresses through molecules, proteins, viruses and the living cell to the human body, descendant from the single-celled amoeba and drawing its vitality from the plants and bacteria nature has so lavishly provided. This human body Dr. Kahn presents as the center of a miniature universe, a universe whose atoms, molecules, cells and organs function as a harmonic whole.

In his unique presentation Dr. Kahn borrows from many sciences: anatomy and physiology form the basis of a study of man which is enlivened by facts gleaned from the fields of physics, pathology, histology, ecology, psychology and anthropology.

Particularly noteworthy are the fine illustrations. Drawings, photographs and diagrams are superior to the usual sketches found in physiology and anatomy books.

Recommended not only to laymen, but to members of the medical profession as well.

M. T.

Surgical Clinics of North America. April, 1943. Vol. 43, No. 2. 318 pp. Cloth, $16. Paper, $12. Issued serially, every other month (6 consecutive bimonthly numbers). W. B. Saunders Co., Philadelphia, 1943.

THIS issue of the Surgical Clinics is devoted to War Surgery. Such subjects as Trends in War Surgery, Traumatic Shock, Indications for the Use of Blood and Blood Substitutes, Treatment of Infected Wounds, Surgical Management of Traumatic Lesions of the Arteries, Effects of Trauma on the Nervous System, Injuries of the Eyes and Eyelids, Fractures of the Spine, Surgical Treatment of Herniated Nucleus Pulposus, Wounds of the Thorax, Repair of Lacerated Nerves at the Wrist, Injuries of the Knee Joint, Use of the Smith-Petersen Nail in Treating Fractures of the Neck of the Femur, Traumatic Wounds of the Abdomen, Treatment of Burns, Traumatic Psychoneurosis Is Organic Injury, Fractures of Tibia and Fibula are well handled by competent authorities.

Five basic features in treatment of war wounds, time and shock elements, débridement, ample dressings and blood transfusions in aftercare, are discussed by John J. Moorehead.

Prevention, early diagnosis and treatment of shock due to hemorrhage and following burns are the subject of a chapter by Charles Child.

George Schaefer points out the indications for the use of blood plasma and blood substitutes in acute hemorrhage or primary or secondary shock or as a preventive measure. Schaefer believes the use of physiologic saline should be avoided.

Moore and Glenn recommend use of the Carrel-Dakin solution plus immobilization in infected wounds, and the sulfa drugs (sulfathiazole and sulfadiazine). They devote some space to gas gangrene and its treatment.

Traumatic lesions of the arteries are classified as injuries, spastic lesions, aneurysms and occlusive arterial diseases by Gerald Patt; who then indicates their proper treatment.

Immediate management of traumatic shock in cases of fracture of the skull, delayed intravertebral hemorrhage, laceration of brain, injuries of the spinal cord, fractures of the neck, myelomalaeia ruptured intervertebral disks, epilepsy after vertebral trauma, post-concussion syndrome and functional disturbances is described by Lewis Stevenson.

Prevention of injuries to the eyes and eyelids is stressed by Kirby and Town.

The remaining chapters deal with various other types of injuries. Spinal fusion in surgical treatment of herniated nucleus pulposis is recommended by Alan Smith. Sonnenschein advises repair of lacerated nerves at the wrist with fine silk before thirty-six hours have elapsed. Kenneth Lewis describes the use of the Smith-Petersen nail in treating fractures. Symptoms of psychoneurosis are given by Pardee.

Kurt Eichelbaum.

Clinical Diagnosis by Laboratory Examination. John A. Kolmer, M.D., F.A.C.P., Professor of Medicine, Temple University. 1239 pp., 75 figs., 137 tables. $8. D. Appleton-Century, New York, 1943.

THE author has contributed an outstanding opus of inestimable value to every member of the profession and students. Its pages are replete with instructive, authoritative and indispensable information. No one can be a successful counselor on matters of health who is not conversant with clinical pathology, biochemistry, toxicology, bacteriology and correlated micrology, serologic and immunologic facts so vital in evaluating clinical entities and dispensing advice in all branches of the healing art.

This work differs from similar books in the important respect of presenting clinical interpretations of given laboratory results. Their practical applications in diagnosis and course of therapeutic procedure are of inestimable value.

This work is divided into three parts and forty-one chapters.

It is an indispensable addition to the library of students and medical men, no matter in what branch of the practice of medicine. Its future is assured.

M. T.

Sulfanilamidoterapia Local. Juan Nasio, Professor at the Facultad de Medicina del Litoral. 150 pp. Aniceto López, Buenos Aires, Argentina, 1942.

MOTIVATED by the conviction that sulfa drugs are the foundation for the future of chemotherapy, not only in practical medicine but also in biology, biochemistry and therapeutics, Juan Nasio has compiled an excellent and complete manual of local application of sulfa therapy as it is known and practiced in Argentina.

A chapter on local sulfa therapy in surgery and medical specialties (dermatology in venereal diseases, odontology, ophthalmology, otolaryngology, gas gangrene) and another on the mechanism of sulfa therapy introduce the report of the author's experimental work on dogs and guinea pigs.

These experiments were undertaken to determine local action, concentration in the blood stream through local absorption, local concentration and behavior of sulfa inhibitors *in vivo*. Cases were divided into three classes: (1) wounds and burns; (2) compound fractures; (3) experimental peritonitis. Sulfanilamide and sulfathiazole were the drugs used in most experiments, although results are also reported for sulfaguanidine in the blood stream concentration tests. Toxic and allergic reactions are discussed, as well as dosage and preparation for local application.

Studies of sulfa therapy in clinical surgery after 1941 convinced the author that these drugs are a valuable adjunct to surgical treatment and important in asepsis. A separate chapter treats of their importance in cicatrization of the skin.

Sulfadiazine obtained from the United States made possible experimental work reported in a separate chapter on local application of this sulfa derivative.

An extensive bibliography, numerous charts, tables, illustrations and case reports make this small volume one of the most thorough studies of local sulfa therapy to appear in print. It is highly recommended to general practitioner and surgeon alike.

M. T.

Traumatic Injuries of Facial Bones. An Atlas of Treatment. John B. Erich, M.S., D.D.S., M.D. and Louie T. Austin, D.D.S., F.A.C.D. Foreword by Ross T. McIntire, Rear Admiral M.C., U. S. N., and Donald C. Balfour, Rochester, Minn. 600 pp., 333 illus. $6. W. B. Saunders Co., Philadelphia, 1944.

THERE are twelve chapters in all, of which the last three are devoted to detailed information and instructions for the construction of plaster casts, descriptions of appliances, methods of oral wiring, use of dental splints, etc. These three chapters should be read first by the average surgeon or student. Every doctor entering military service should read these three chapters. The first nine chapters are arranged in atlas form, showing by means of excellent illustrations, photos of x-rays, etc., specific examples of the types of lesions being discussed. There are 333 illustrations in all. These are arranged to fit the text in perfect sequence, so that one may see the illustration on the page opposite the text describing it.

Chapter I is very important and should be read and re-read as it covers the emergency treatment of the patient, as a whole, including the care of shock and hemorrhage, the establishment of an airway, prevention of infection of bone of the face, proper care of facial soft tissue wounds, etc.

The next eight chapters are full of concrete, illustrated examples of various types and combination of types of various traumatic bony defects of the facial bones, along with the methods of treating these lesions.

This book should be in the library of every surgeon who attempts to care for patients with injuries of the facial bones.

Horace E. Turner.

Kinetic Bandaging. Seymour W. Meyer. 310 pp. 540 illus. F. A. Davis Co., Philadelphia, 1943.

THIS book is novel in that it explains the why and rationale of certain types and methods of bandaging. As one knows, this is a subject which is difficult to present because of the nature of the subject matter and methods of presentation. However, it has been well handled by Dr. Meyer.

The book is timely in that it appears at a period when war emergencies and civil emergencies are at their height. This much neglected subject now becomes interesting to the doctor who is called upon to give first aid lectures and enter into such discussions.

Chapter 23 on regional bandaging with the triangle is especially well done.

This is a book which can be recommended to the student and practicing physician alike.

P. Thorek.

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